July 1977

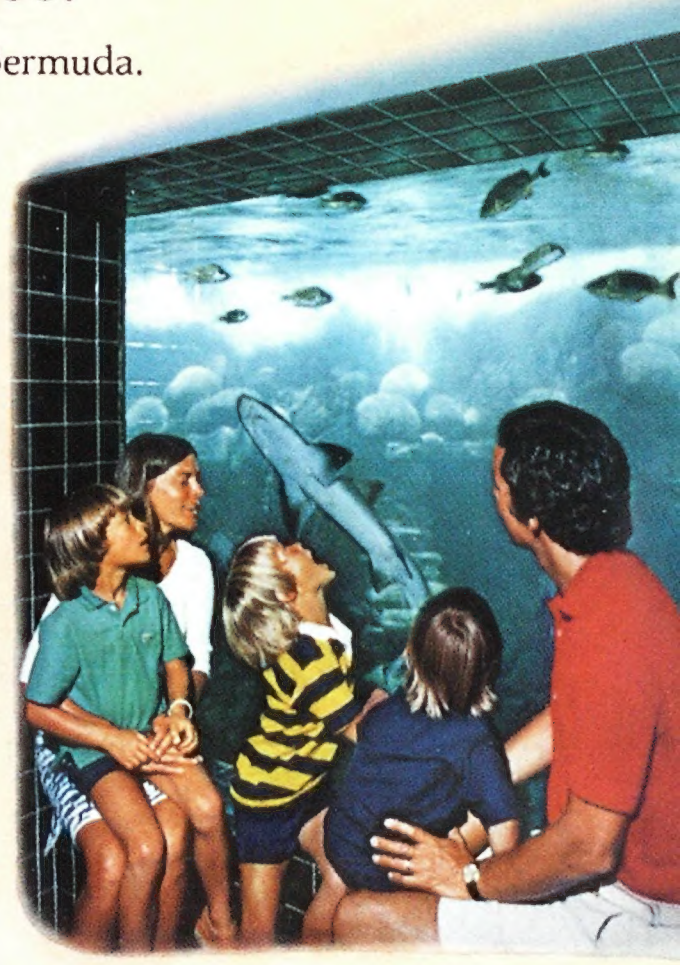
Smithsonian

Brady, the first great war photographer (p. 24), at Gettysburg soon after battle

"When we rode the tiny ferry on Great Sound, the captain said 'Come on in kids, and steer the boat'. The people here are just so nice."

Paul and Betsey Horovitz talk about their fifth visit to Bermuda.

"It was so exciting at the aquarium, watching the children learn, sharing all their little discoveries."



"The children just wouldn't leave the beach. They discovered that Bermuda's soft, pink sand is excellent for sand castles."

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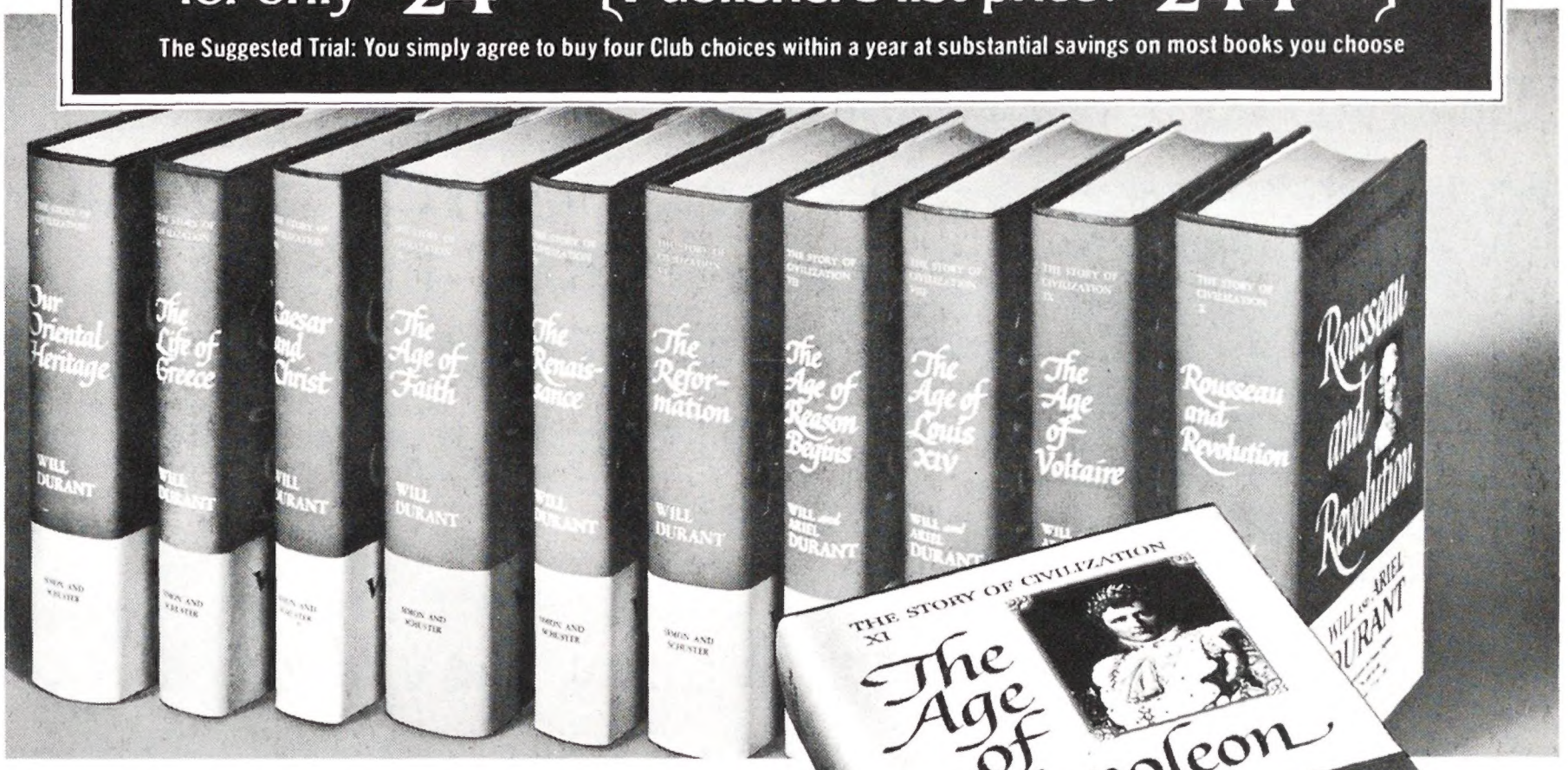
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The Age of Faith
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Smithsonian

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OPERATION

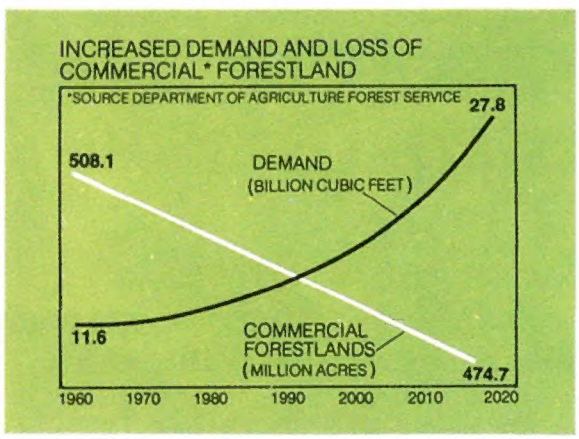
A report on how the forest industry is working to get twice as much wood from America's commercial forests. Year after year. Forever.

Wood is one of the world's most valuable resources.

It's America's busiest building material. It's also the basic ingredient in pulp, packaging and a thousand other products—right down to the paper this ad is printed on.

More Wood From Less Land.

But while world demand for wood is *increasing*, the amount of land available for commercial forests* is *shrinking*. Some of it has been set aside for parks and wilderness areas. Much of it has been turned into farms, freeways and new developments.



The chart above shows that U.S. consumption of all wood and paper products will double in less than 50 years. Thus the reason behind Operation Double Tree—the forest industry's name for intensive forest management that can double the amount of wood grown on a given piece of land. And do it in such a way that the forest remains a valuable part of the ecosystem.

**Commercial forest is described as that portion of the total forest which is capable of, and available for, growing trees for harvest. Parks, wilderness and primitive areas are not included.*

Double Tree is ambitious and is already working.

All across the U.S., forest product companies are working to double forest yield. In Oregon and Washington, forest product companies are predicting triple growth with genetically superior trees planted in prime forestlands.

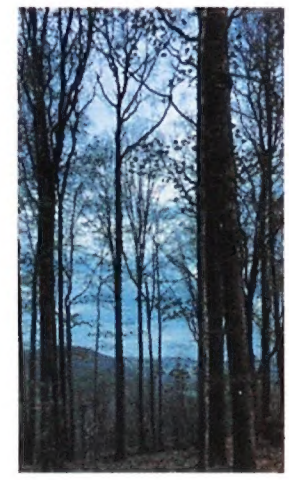
West

South

Through thinning efforts alone, some companies in the Great Lakes States have increased diameters of remaining trees enough to double wood volume per acre over a 35-year period.

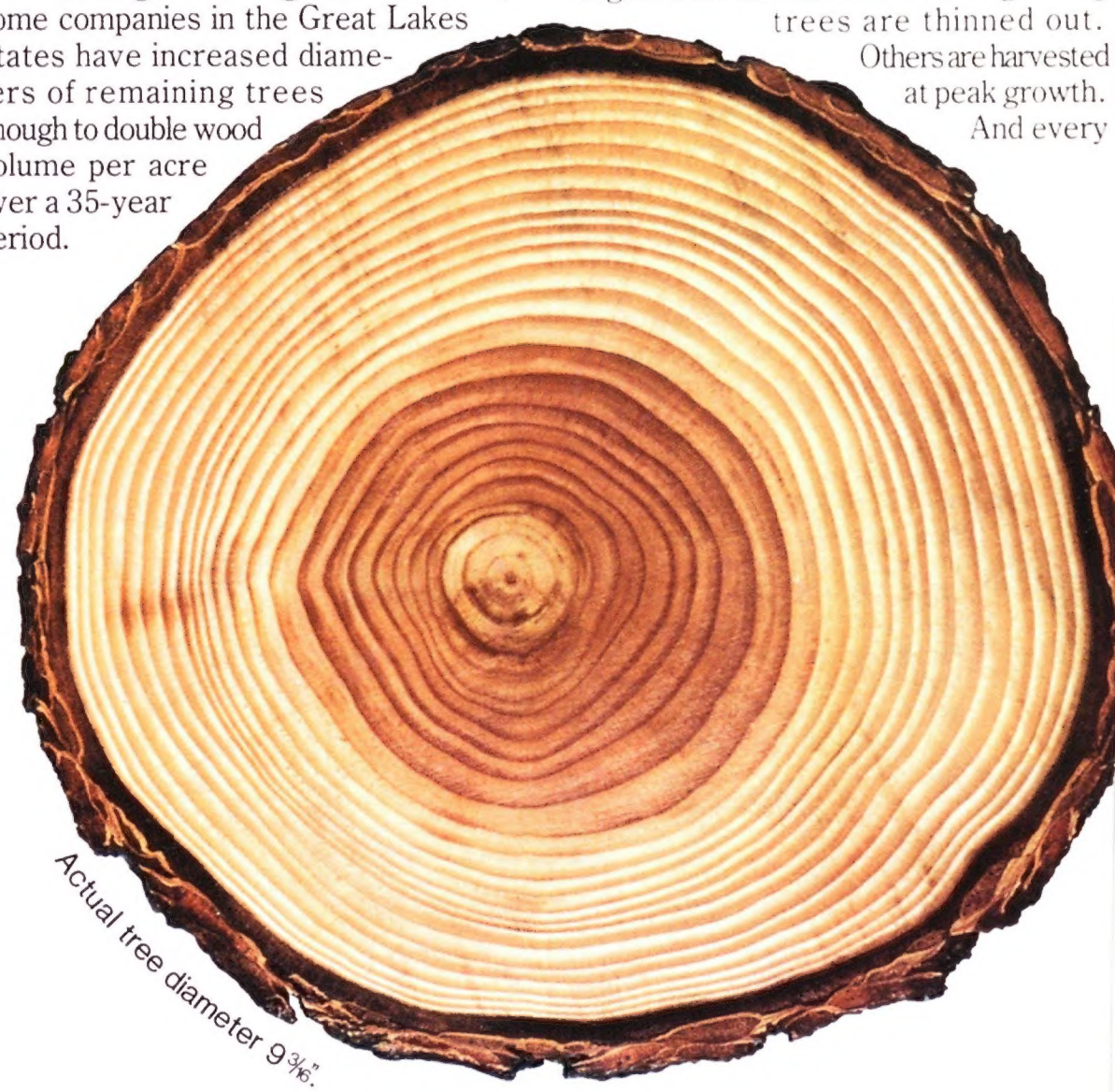
Double Tree isn't limited to large industrial tree farms. Individual woodlot owners from Maine to Georgia are putting idle lands to work, creating green belts that offer the twin payoffs of an increased harvest *and* eternal forests.

That may sound like a paradox, like eating a cake and having it, too. But unlike oil or coal, wood is one natural resource that is *renewable*. And modern forestry has found ways to make Mother Nature more productive.


Great Lakes

New England

Today's intensive forest management is rooted in nature's own ecological cycle. It begins with the harvest. Slower growing trees are thinned out. Others are harvested at peak growth. And every


Actual tree diameter 9 3/16".

The two Douglas firs to the right grew in the forests of the Cascade Mountains of Washington State. Both were harvested when they were 25 years old. The difference is, the larger one grew in an Operation Double Tree area, while the smaller one did not.

DOUBLE TREE

attempt is made to use every last part of the tree: tops, limbs and bark.

The New Forest.

But the real key is in the *new* forest. The new trees.

In some areas, foresters plant new seedlings by machine, or by hand. Helicopters are also used to re-seed. When young seedlings go in, the forest often gets a five-year head start over natural regeneration in the same area.

Many of them are of genetically superior stock, the result of years of selective "breeding." Seedlings by the hundreds of millions are grown in special nurseries. They're healthier, faster growers that mature faster and can be harvested sooner.

Some forestlands, such as those in the Northeast and Lake States, are left to Mother Nature because natural regeneration does a better job.

Wood is America's busiest building material.

Soil studies determine prime growing areas. When necessary, nutrients are added. And the young trees are protected from destructive insects, fires and natural enemies.

The result is a better quality forest, one that can be at least twice as productive.

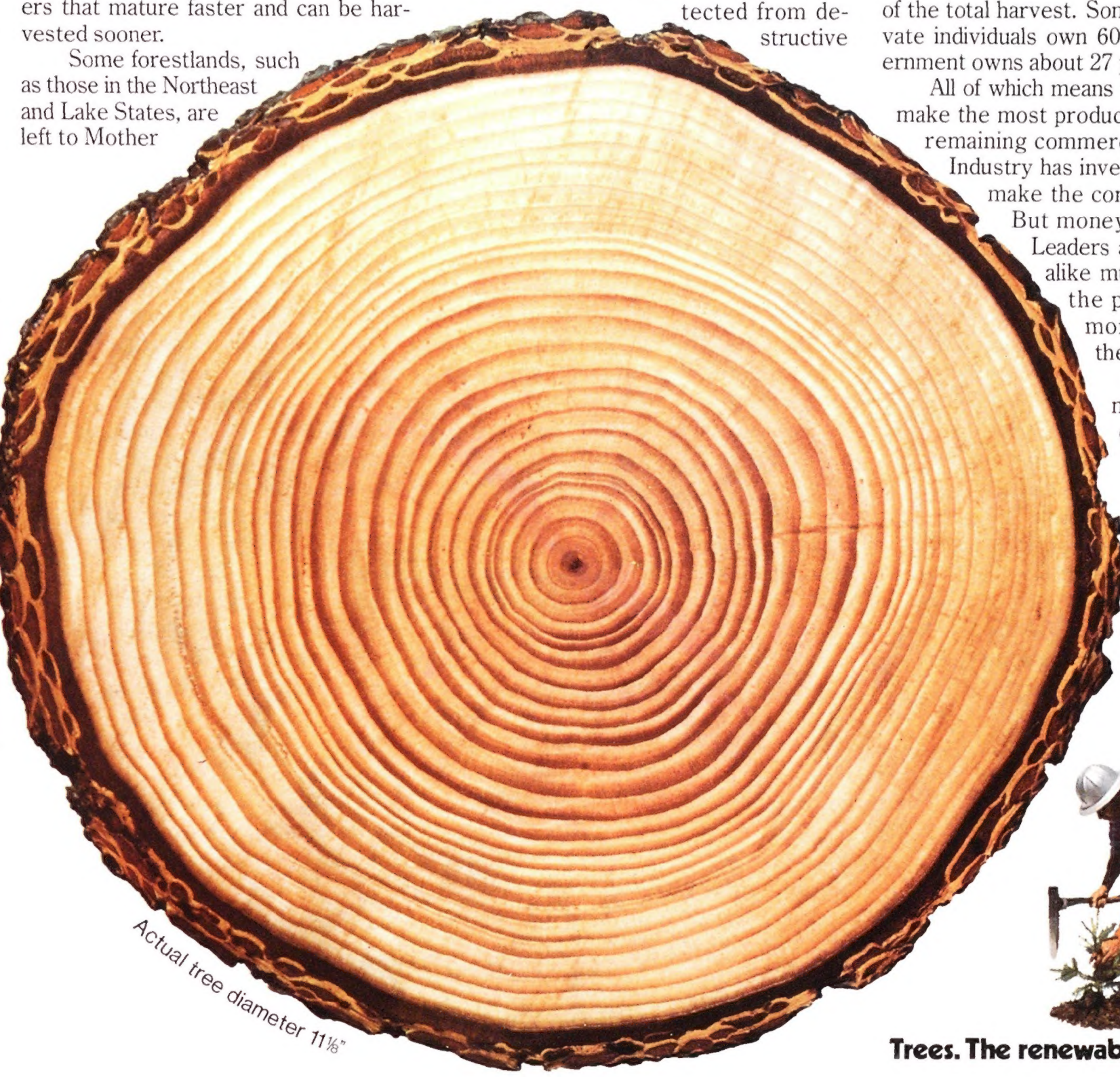
Who Owns The American Forests?

Significantly, the principles of Operation Double Tree are being used on only a small portion of America's forestland. And good as Double Tree is, it might not be enough. Too much of the American forest is still under-utilized and under-productive.

Overall, industrial forestlands are working the hardest. Industry owns only 13 percent of the commercial forestland, but it provides almost 30 percent of the total harvest. Some 4 million private individuals own 60 percent. Government owns about 27 percent.

All of which means we must join to make the most productive use of our remaining commercial forestland. Industry has invested millions to make the concept a reality. But money isn't enough. Leaders and landowners alike must understand the problem. And, more important, the solution.

For more information, write for our free booklet "Managing the Great American Forest," American Forest Institute, P.O. Box 873, Springfield, VA 22150.



Actual tree diameter 11⅛"

Trees. The renewable resource.

The view from the castle

Technological development begins with the need to fulfill a function, but that is often forgotten—look at our 1876 exhibit

One of the most exuberant of the Smithsonian's Bicentennial exhibitions was the re-creation of the Philadelphia Centennial Exposition of 1876 in our Arts and Industries Building. Aside from the charm and beauty of examples of the opulent taste of that time, there was also a lesson to be learned. America had achieved a mastery of technology by 1876. The succeeding years marked a great leap forward for our country. The evolution of machines closely adapted to their purposes—from simple tools to great engines or those subtle inventions of communications and power, the telephone and the electric light—was accomplished within the limits of a new imperative: they had to be functional before all else.

Now, a hundred years later, there is something very real to learn from such an exhibition. It is that the functional tradition is often lost through our failure to study history. Design becomes formalized, and in the process the purpose eventually disappears. Tradition thins out into mere style, and style alone leads to poor functioning.

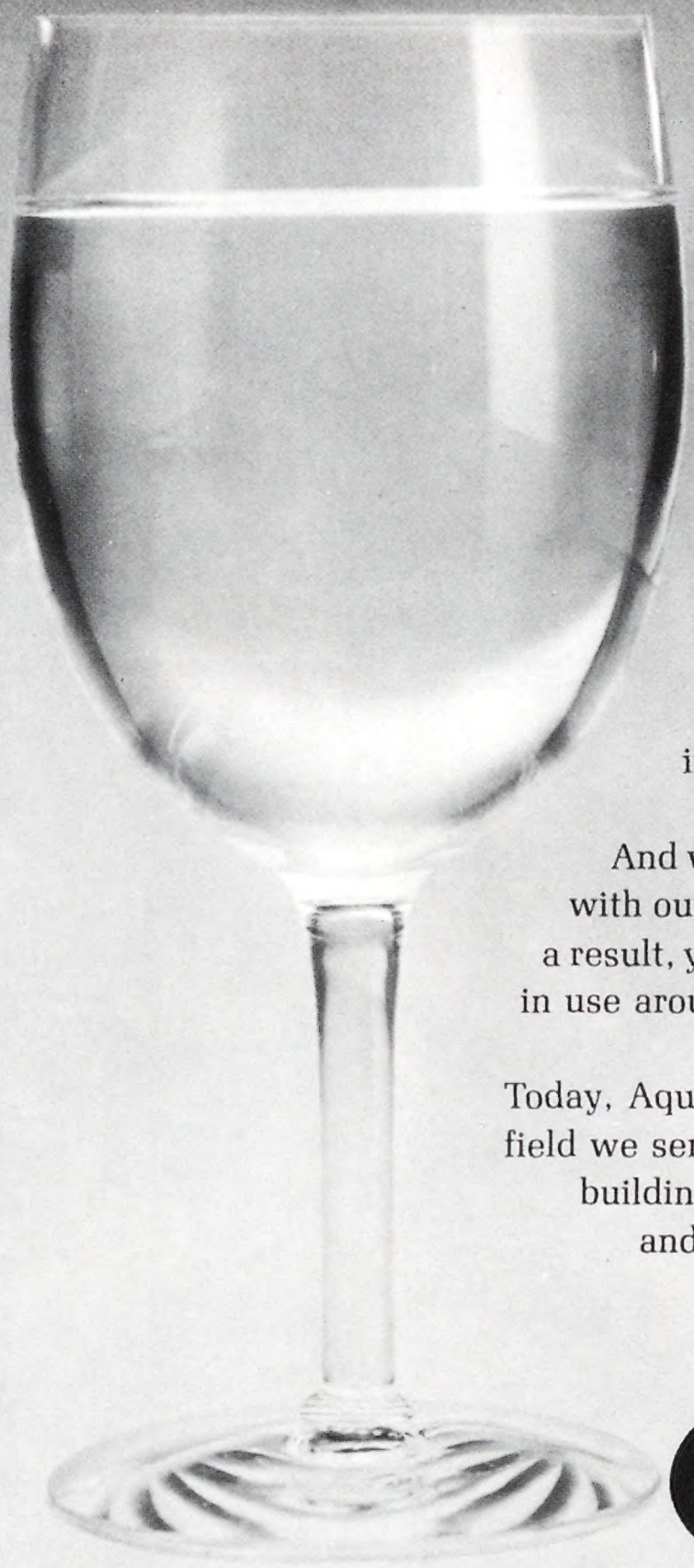
For the best part of a century, some of us have thought that the design of automobiles was quirky, even verging on the ridiculous. The earliest cars were of course "horseless carriages," lacking anything else to model themselves on, with such unnecessary features as leather holders for whips for nonexistent horses in nonexistent shafts. Later, when a more truly functional tradition had been established, with engines in place, tops, protective windscreens and running boards to step on, a certain design concept began to emerge. "Style" came to mean streamlining, as if cars in the end might pass through the sound barrier. Then, for a while, purely decorative elements proliferated, so that cars began to look like gingerbread houses.

Along the way, the vocabulary of function disappeared, leading to such absurdities as painting steel or plastic panels to simulate wood on station-wagon sides. By ignoring function, style has become illiterate. And with illiteracy has come mindless caprice.

The history of transportation demonstrates that economy and efficiency are the paramount motives. In the last ten years something has happened that should have jarred us back to these realities. We have learned that the United States now imports nearly 50 percent of the oil needed for domestic consumption, compared with two or three percent in 1948. Thus functional design has been threatened, as the horse was, by a technology that is now nearly outmoded. The real concern of the automobile manufacturers is not that the more efficient cars of the future won't sell, thus creating massive unemployment, but rather that they will have to retool and invest in new machinery.

Meanwhile, alternative power sources are receiving little functional design attention, and even smaller, lighter cars—which Detroit says will be here by 1985—are still largely on the drawing board. The machines in our 1876 exhibit, though still superbly functional, are decorated with innocent cast-iron ornaments and gilt curlicues. It is a presage of what was to come. The lesson is there, the example of history is an open book. Museums are indeed powerhouses for the imagination, for learning the lessons of history.

S. Dillon Ripley



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At Last!

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The American Rose Collection

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Approximate size of bell is 4½″ in height and 3″ in diameter.

Fine English Bone China stands alone as representing the absolute finest of the china maker's art. And in the world of beautiful flowers, roses are the most beloved. To portray the exquisite and delicate beauty of America's most beloved roses in a limited edition collection of Fine English Bone China bells is an accomplishment worthy of worldwide collector interest.

At Last — Bells of Fine English Bone China

Fine English Bone China has become known as the rarest and best of all the fine china available throughout the world. By every standard used to judge excellence, it is unsurpassed. Its ivory-white color cannot be duplicated. Its light weight gives an impression of delicacy found in no other china. Yet, its strength gives it a durability that belies its delicate appearance.

To produce Fine English Bone China is an art that has been mastered by only a few master china makers. The home of most of these master craftsmen is Stoke-on-Trent, England, truly the Fine English Bone China capital. And it is in Stoke-on-Trent that the beautiful bells that make up this limited edition will be crafted.

Because Fine English Bone China is so difficult to make, and because the demand for the limited quantities that can be produced is so great, it is rare to find an exclusive, privately commissioned, limited edition bell collection made of this precious material. Literally years of careful planning and diligent work are required to make such bells a reality.

But, such bells are now, at last, available. The opportunity to acquire these bells is here, but for only a limited time.

Each Bell a Beautiful Work of Art

To create a bell collection worthy of Fine English Bone China, a specially designed bell shape was created. To produce this unique shape, each bell will be individually cast by hand. Then to complement the delicacy and exquisite beauty of each bell, original paintings of 12 of America's most beautiful roses were commissioned. In this way, each of the 12 bells in the collection colorfully portrays a different rose from the gardens of America. Therefore, the complete collection creates a bouquet of beauty that can be displayed proudly in your home.

Approximate size of bell is 4½" in height and 3" in diameter

Each Rose Beautifully Captured In Full Color

Each rose design is an original work of art created expressly and exclusively for this collection. The commission for the rose designs was awarded to two highly respected rose artists: Norman Langford of England and Allianora Rosse of the United States. Two artists were chosen so that a variety in artistic style could be given to the designs. Yet styles were chosen that were compatible with one another so that the 12 designs combine to make a unified collection. Each artist has captured in his and her own way the elegance of the roses with their beautiful array of colors. The efforts of these artists have combined to create a spectacular collection of America's most beloved roses.

Continued on next page ►

◀ Continued from preceding page

To insure that the full beauty of the artist's original painting is faithfully captured on each bell, the fine skill of old world craftsmen, using techniques involving 20 separate colors, will be called upon. Each bell will be hand decorated and, as a final touch of luxurious elegance, precious 22kt. gold will be applied, by hand, to both the handle and base of each bell.

Issued Under The Auspices of The American Rose Society

Because of the significance of this limited edition collection, it will be issued in the United States by the Danbury Mint under the auspices of The American Rose Society. The Society is the oldest and most prestigious in the United States. For the first time since its founding in 1899, this distinguished horticultural organization has agreed to the issuing of a bell collection under its auspices.

A Strictly Limited Edition

To maximize the heirloom value of this collection, it will be issued in a strictly limited edition, available only by advance reservation. *In the United States, reservations for this collection of Fine English Bone China Bells will be valid only through July 30, 1977, and then the edition will be closed forever.*

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You can reserve your subscription to the *American Rose Bell Collection* by simply completing the reservation application. You need send no money now. You will be billed for each of your bells prior to shipment.

Approximate size of bell is 4½" in height and 3" in diameter

Approximate size of bell is 4½" in height and 3" in diameter

The *American Rose Bell Collection* consists of 12 individual bells to be issued at a rate of one bell every two months. Subscribers are guaranteed the same price for each new bell throughout the entire collection.

Guaranteed Satisfaction

Should you receive any bell that you are not completely satisfied with, you may return it upon receipt for replacement or refund. Naturally, you may cancel your subscription at any time.

Please Act Promptly!

Please keep in mind that subscriptions can be guaranteed only until July 30, 1977. So please act promptly. Do not miss this rare and valuable collecting opportunity.

18-60

RESERVATION APPLICATION

American Rose Bell Collection

The Danbury Mint
47 Richards Ave.
Norwalk, Conn. 06856

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Postmarked By
July 30, 1977

Please accept my subscription reservation to the *American Rose Bell Collection.* I understand that this collection is a limited edition of 12 Fine English Bone China bells each depicting a different American rose. The bells will be issued at a rate of one every two months at a guaranteed price of $25 per bell (plus $1.50 postage and handling).

I understand that I need send no money now. I will be billed for each bell prior to shipment. I may cancel my subscription at any time, and any bell that I am not completely satisfied with may be returned upon receipt for replacement or refund.

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Address _____

City _____ State _____ Zip _____

Signature _____

☐ Check here if you want each bell charged, as it is shipped, to your:
☐ Master Charge ☐ BankAmericard

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Credit Card No Expiration Date

Letters to the Editor

Dear Sir: It was interesting to read that Marc Antony's army ate jimsonweed on its retreat from Parthia in A.D. 38. It must have had remarkable powers indeed to have given Marc Antony 68 years of additional life after he had committed suicide in 30 B.C.

Eugene N. Lane
Professor, Classical Studies
University of Missouri
Columbia, Missouri

We marched him into the wrong century. Marc Antony invaded Parthia in 36 B.C. *and committed suicide in 30* B.C. Ed.

Toxic plants

Dear Sir: In your May issue, Dr. Robert Arnold and Laer Pearce wrote about toxic plants, which included such common houseplants as philodendron and dieffenbachia. I have both of these plants in my home and am much concerned, especially with dieffenbachia, which you say could cause death by suffocation. It alarms me that nurseries and garden stores are allowed to sell such potentially lethal plants without warning that they are dangerous.

Walter Oberstebrink
Manhasset, New York

These common houseplants contain oxalate crystals and enzymes which can cause swelling of the mouth and throat with a danger of suffocation. They are dangerous to children, especially, but up to now, no warning labels have been required by the government. Ed.

Dear Sir: As an example of the nontoxicity of apricot pits, my wife and I have eaten, on the average, ten pits each every day for the past seven months. We also eat apple seeds and prune pits whenever we eat the fruit. If all these things were as poisonous as your article indicates, we should be dead.

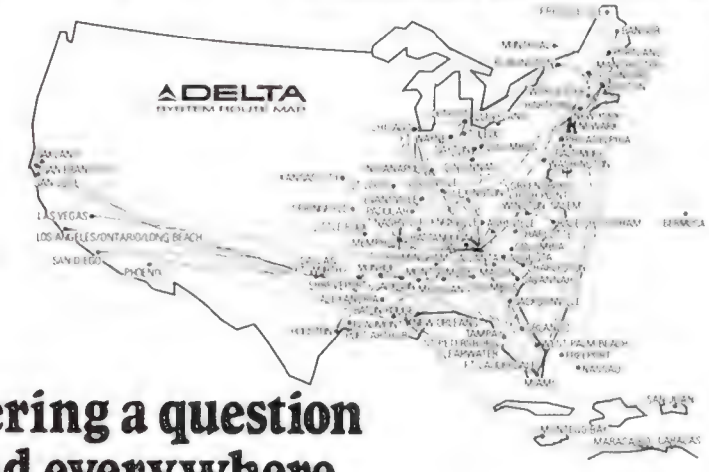
W. Gerard Fassnacht
South Bend, Indiana

Just recently there have been reports in California of people becoming ill with cyanide poisoning after eating apricot seeds. Exactly how many it takes to kill an individual is not known, but the article was simply pointing out the potential danger. Ed.

Purple martins

Dear Sir: I expect that purple martin lovers from all corners of North America will be responding to Mary Hamman's delightful piece on this splendid bird species. My wife and I bought one of the ready-made houses from the Nature Society in Griggsville, Illinois, the "Purple Martin Capital of the World." We already have two pairs in residence.

Recently, I photographed the largest martin house in the world at Lake Charles, Louisiana [see below], which can



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house 2,232 adult martins. Last year, its eighth year, the 120-foot complex had 1,200 nesting adult martins.
Dan Guravich
Greenville, Mississippi

Dear Sir: At first I was as unsuccessful as Mary Hamman in attracting purple martins, but a friend presented me with four gourds, each with a two-inch hole drilled in the side and a smaller one at the bottom for drainage, plus one for the wire to hang it by. I was told to put them on each corner of my elaborate "castle," and I would get martins. I did, and we have 15 pairs nesting this year.
A. T. Vaughan
Lake City, Florida

Fore culture

Dear Sir: E. Richard Sorenson's article on the Fore people of Papua New Guinea gives a fascinating description of their simple life-style, which may account for why they have existed so peacefully. They were able to establish a world of love and a feeling of closeness that is very much lacking in Western societies. Instead of imposing our life-style on others, let's make a law against interfering with other cultures. Must one be a bald eagle to be considered endangered?
Mary Purinton
Towson, Maryland

Dear Sir: In writing about the Fore, the author would seem to have us regard them as a kind of "noble savage" in contrast to our own decadence and corruption. One wonders, however, if they really are any more primevally innocent than we are innately evil. At least one form of their person-to-person contact had less beneficial consequences. They possessed the highest-known incidence of kuru, a disease contracted by eating the brain of their dead kinsmen.

We are both victims of a changing world, and we are both seeking something better. It is neither better nor worse to be a recently made-over cannibal suddenly propelled into a market economy than it is to be a former peasant in the postindustrial world. We are both beset with the problems imposed by a radical change in our way of life.
C. Loring Brace
Museum of Anthropology
Ann Arbor, Michigan

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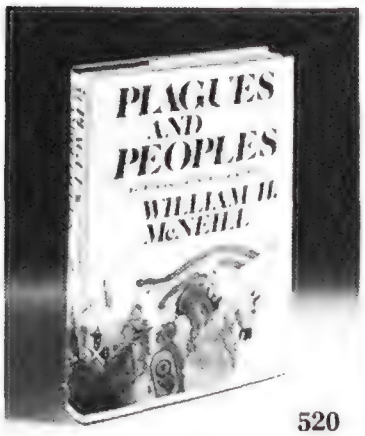

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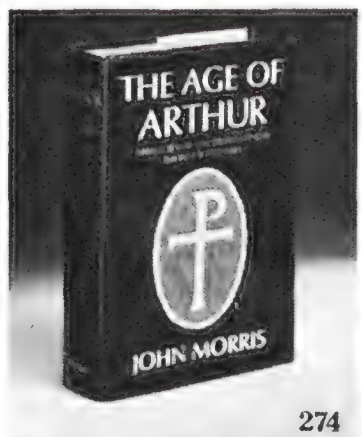

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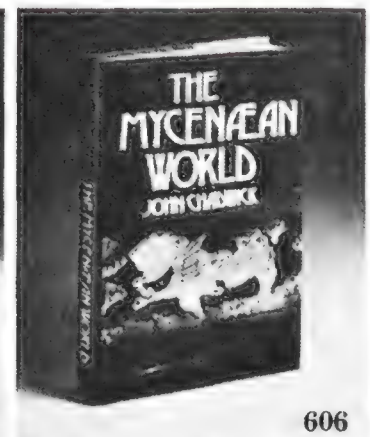

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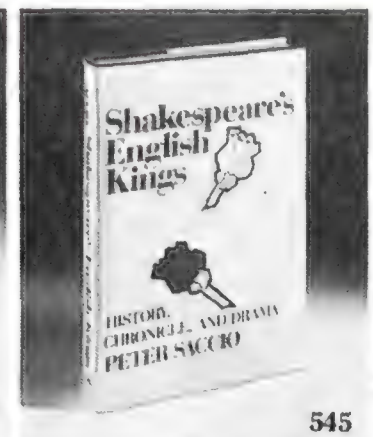

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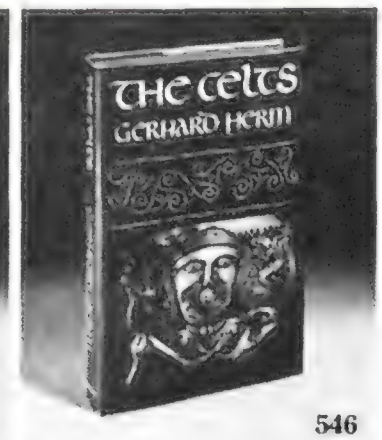

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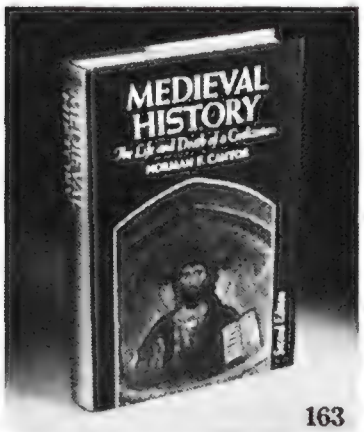

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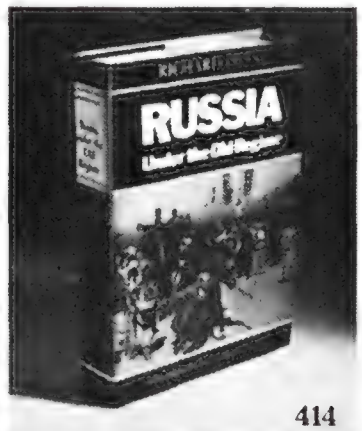

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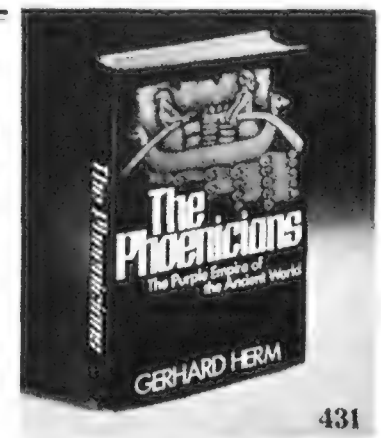

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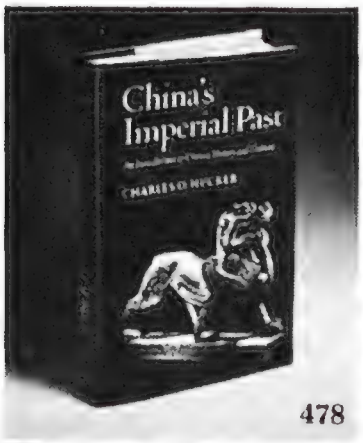

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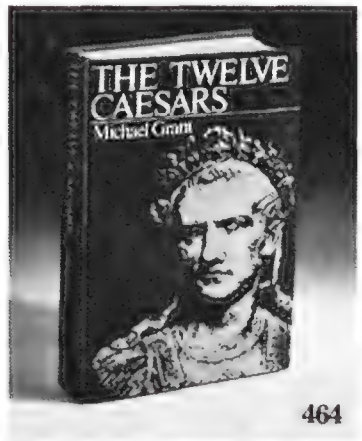

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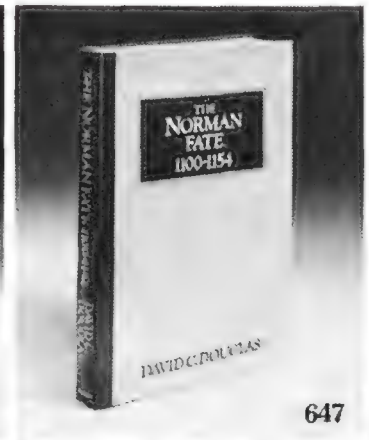

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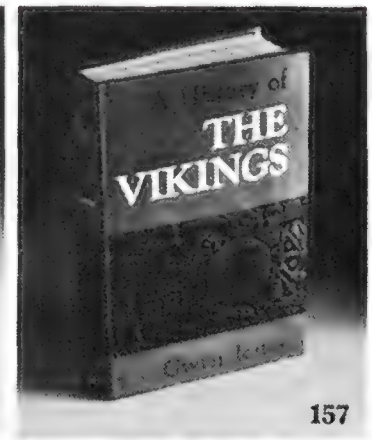

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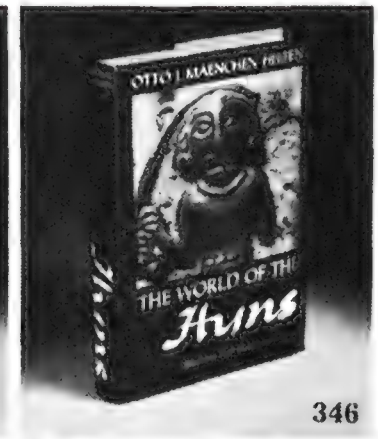

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Dr. Sorenson's article was about child-rearing and child behavior, rather than cannibalism. In his book, The Edge of the Forest, *he discussed kuru at length and how the Fore thought it was caused by sorcery. They gave up cannibalism around 1960-61 when they discovered how repugnant it was to Westerners.* Ed.

Dear Sir: I have been doing quite a bit of reading in cultural anthropology, hoping to gain some insight as to why there is such a decline in human relations. I feel that what took place with the Fore people explains it in part. I'm not so naive as to believe that their total culture would work in our society, but we don't have to put aside all close human contact and response to survive and cope with the culture we have created.
Janice L. Ferraro
Weirton, West Virginia.

Phenomena, comment and notes

Dear Sir: In regard to your item on grinding tires and retrieving bits in the form of oil, it is still in the research stage.

A number of private companies and governmental agencies in Oregon have been wrestling with the tire problem specifically for ten years. With that time and thousands of dollars invested in research and operation, the first need noted is for a machine or process that *will* grind the tires. It is the belief in Oregon that tires can be put through a series of two grinders and that the resulting particles can be used in furnaces now using coal or wood—and with very little change in the furnaces.
William B. Culham
Portland, Oregon

Dear Sir: Your energy-from-burning-tires item has been overinflated. My mathematics tell me that 2.5 times 200 million is 500 million—not five billion.
Sidney N. Shurcliff
Cambridge, Massachusetts
Mr. Shurcliff is correct. Ed.

Clover and Henry

Dear Sir: I seem to remember hearing that the arches of Henry Adams' house, shown in your April issue, are still extant somewhere in Washington. Is that true?
Ralph Theodore
Washington, D.C.
Yes. When the Hay-Adams houses were demolished in 1927 to make way for the hotel that replaced them, architects who admired their designer—Henry Hobson Richardson—rescued some of the handsome stone carvings. The Adams arches were incorporated in the house shown below (the left arch was shortened to frame the front door, thus changing the original configuration). Elements of the John Hay house were used on another dwelling a few blocks away. Ed.

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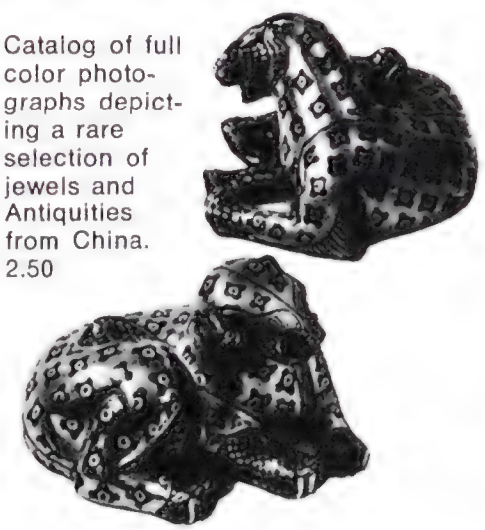

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Phenomena, comment and notes

Obesity as part of nature's plan,
North America gets its own cheetah,
and simplifying our family tree

The willing pilgrim peering into the ancient past in search of his true roots is greeted by academic controversy and big words, most of which end in "pithecus," the Greek for ape. Nevertheless, the task seems worthy, so one girds one's loins (if they are not, unlike our ancestors', already girded) and plunges into a report by Dr. Elwyn L. Simons of Yale in *Scientific American* (Volume 236, Number 5) to learn that, happily, the "pithecus" underbrush has been cleared away a bit.

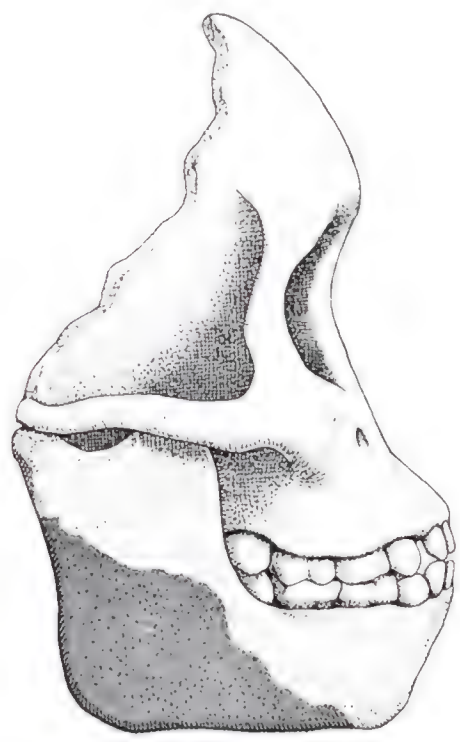
Graecopithecus, Kenyapithecus and, probably, *Rudapithecus* all can now be thought of as *Ramapithecus brevirostris,* which means Rama's short-snouted ape, Rama being a mythical prince of India, where the first *Ramapithecus* remains were found. And the short snout is noteworthy since it suggests progress toward being human as opposed to pithecine. Indeed, Dr. Simons says *Ramapithecus* is an early if not the first hominid.

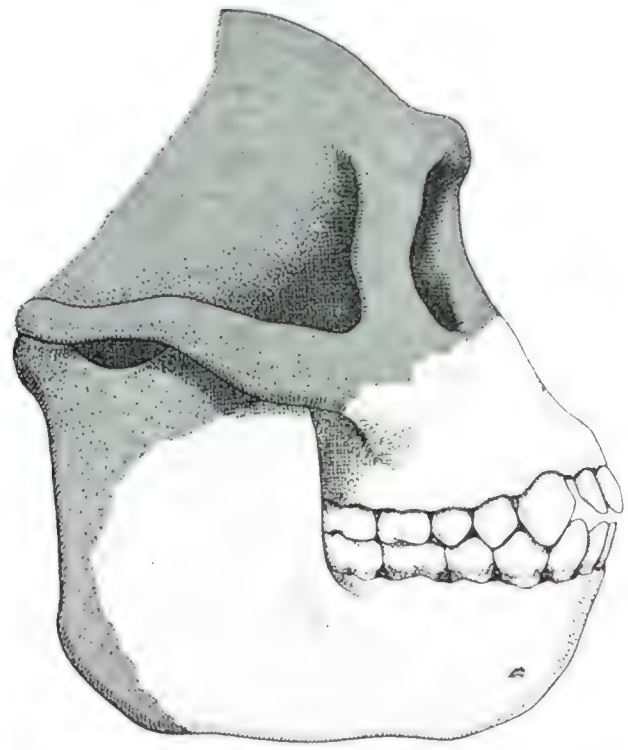
Ramapithecus apparently arose some 15 million years ago from a very cosmopolitan line of forest-dwelling apes called *Dryopithecus* whose remains have been found in Africa, Asia and Europe (as have those of Rama's ape).

Until about eight million years ago, when he disappeared, *Ramapithecus* lived on the border of temperate zone forests and ate nuts and, seasonally, fruit (*i.e.,* he had left the trees for the ground). Then about four million years ago *Australopithecus* showed up, along with some members of *Homo.*

Ramapithecus was not only short-snouted, but his teeth, like those of *Australopithecus,* erupted at relatively long intervals, suggesting a long period of infancy, which is a humanlike trait. So it seems that *Ramapithecus* is our link to the ancient apes of the Miocene.

From there it gets more complicated. Modern great apes have U-shaped dental arcades. Man has a semicircular arcade. The Dryopithecine apes, on the other hand, had V-shaped arcades and so did *Australopithecus.* But *Ramapithecus* had an intermediate arcade somewhere be-





The face of juvenile *Australopithecus,* at left, is almost as large as that of a full-grown *Ramapithecus,* right. In each case, shaded portions are conjectural.

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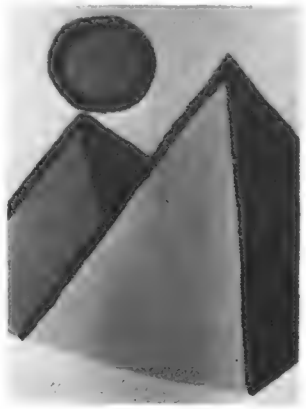

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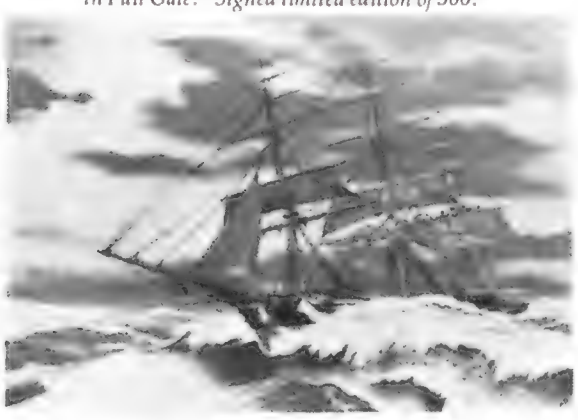

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tween a U and a V. Also, in certain other dental matters, *Ramapithecus* and *Homo erectus* are more like each other than either is like *Australopithecus.*

The remains of *Australopithecus* have been found only in Africa. *Homo erectus* was just as cosmopolitan as *Ramapithecus.* Dr. Simons says he would not be surprised if *Australopithecus* fossils were found on other continents. From a biological viewpoint, he adds, it would be surprising if only that part of the *Ramapithecus* population living in Africa gave rise to *Australopithecus.* The implication is that Africa can no longer claim to be the exclusive cradle of mankind. He also suggests that during the four-million-year gap after *Ramapithecus* there was an intermediate form, yet to be discovered, that gave rise to *Australopithecus* and *Homo,* the former regressing into a small-canine-tooth syndrome and verging off into extinction, while the latter, with his robust Ramapithecine canines, progressed to our present glory—the state of being wise.

Dr. Simons also reminds us that it is possible, though unlikely, that *Ramapithecus* evolved directly into both *Homo* and *Australopithecus,* or that *Ramapithecus* was a dead end and that some other hominid arose from the Miocene apes and is our true ancestor. But for now, *Ramapithecus,* peacefully munching nuts and, appropriately, roots on the savannas of ancient Eurasia, perhaps with the stirrings of proto-thought buzzing behind his lowslung forehead, seems a perfectly satisfactory progenitor.

This "cheetah" once roamed our West.

An additional cat for America

Wherever mankind arose, Americans both North and South must resign themselves to the fact that it probably wasn't *here.* Even so, it too must have been a fascinating scene here in the Ice Ages, with a host of mammals large and small chasing each other (and being chased by newly arrived mankind) over the plains of the continent.

It is a pleasant and harmless habit, now that most Americans' wildlife experiences are restricted to starlings, squirrels and stray dogs, to let one's mind rove over the Pleistocene roster: mammoths, wolves, big horses and little stilt-legged horses, bears, bison, camels, sheep, pumas, jaguars, coyotes and lions.

Now a report in *Science* (Volume 195, Number 4282) adds another detail to the panorama. In Wyoming, on the western slope of the Big Horn Mountains, is a hole in the ground, a vertical cave that had acted as a natural trap for unsuspecting animals for 300 million years until the Bureau of Land Management closed it off in September 1973. This sinkhole is known, appropriately, as Natural Trap Cave and, for the past several years, researchers from the universities of Missouri and Kansas have been sifting through the layers of remains of mammals which, over the ages, unwittingly fell in it. So far they have dug down to layers some 13,000 years old, collecting 2,500 mammal bones—mostly horses (perhaps proving the thesis that horses are especially stupid).

In any event, the fauna of the time was unusually rich in "specialized cursorial forms, suggestive of open country." For example, the sheep forms, now extinct, had longer legs than modern mountain sheep. But what is of particular interest is that, among all the disarticulated skeletons in Natural Trap Cave, the researchers found and for the first time identified

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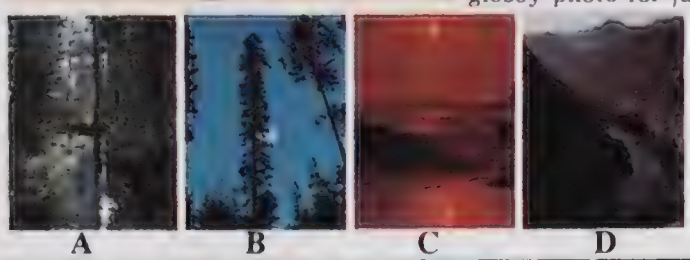

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the remains of our own North American version of that most admirable and most fleet of animals—the cheetah—thought till now to have been missing from the Western Hemisphere's fauna.

Called *Felis trumani,* it has been discovered here before—in Nevada—but was confused with pumas. Though not directly related to Africa's cheetah, it evolved many of the same characteristics—the long legs, small upper canine teeth, short face and broad forehead.

So, you'll be relieved to know, you can now add to whatever mental movie you replay of that marvelous period, the sudden blur of a "cheetah" propelled like an arrow across the prairie at some 60 miles an hour.

The advantages of fat

People who, like North Americans, live a relatively affluent, sedentary life are inclined to be fatter than those in labor-intensive societies, such as Gambian farmers. Behind what would seem obvious, however, are some curious facts, brought to light by two scientists in *Nature* (Volume 266, Number 5600).

The body stores energy in the form of fat and protein. Fat people store a higher proportion of energy as fat; in lean people the ratio of energy stored as protein over the total energy stored is much higher. The Australians point out that it would be an advantage in Gambia, say, to store energy as fat because intense labor during hard times would use up fat rather than the muscle needed for the labor. If Gambians seem lean, it is because they work hard.

And the fact that so many North American men run to fat as soon as affluence permits an excess intake of energy suggests that evolution has designed into the race the tendency for most people to store a high ratio of energy as fat: in other words, a genetic inclination to obesity has, for most of history, had survival value. Now the opposite may be true. An affluent obese person pays a double penalty: both the extra weight and the fat itself can cause ill effects. But the authors have good news. There is evidence in North Americans of a genetic drift toward storing more energy as protein. Succeeding generations may find themselves lean and trim, which is fine as long as they stay affluent.

—JAMES K. PAGE JR.

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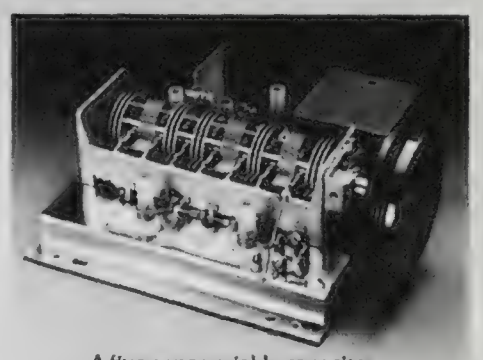

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Obviously, these are only a few of the refinements that went into the SX 1250. But given just these few things, it should come as no surprise that the SX 1250 even weighs more than most of our competitors' high-powered offerings.

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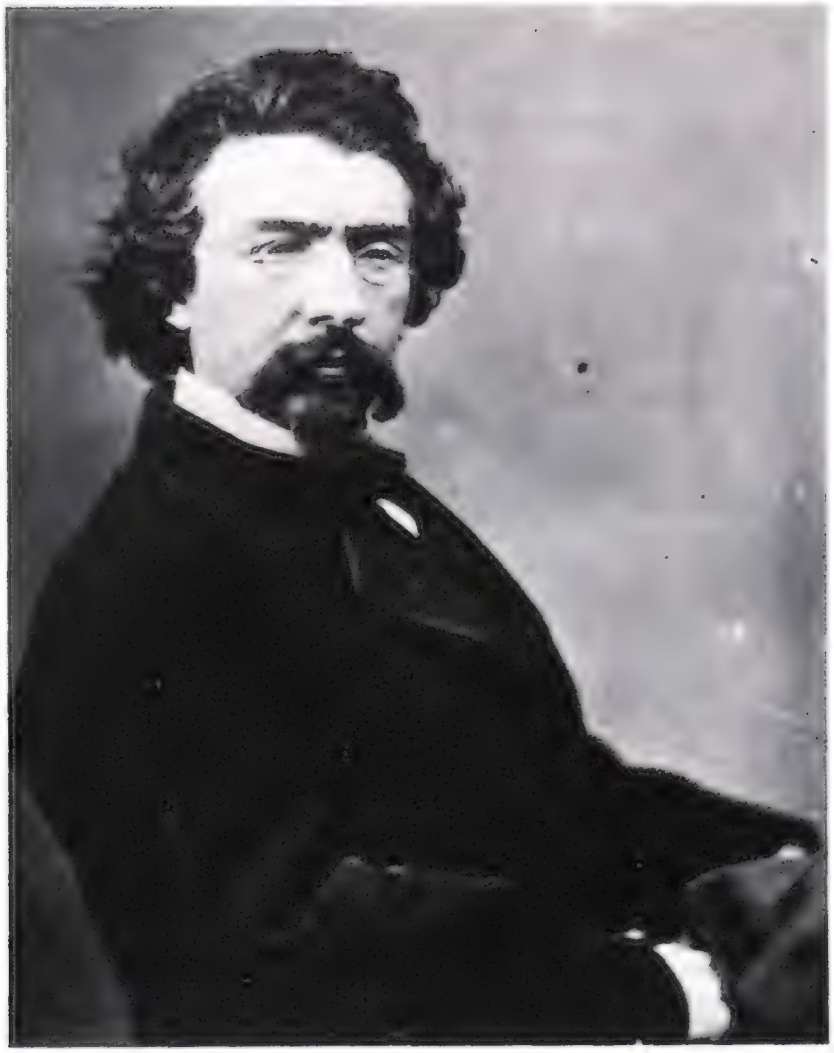


Mathew B. Brady at the height of his career was a quick, nervous man, standing about five feet seven.

By Philip B. Kunhardt jr.

Images of which history was made bore the Mathew Brady label

First of two parts

The photographer (and his staff) collected vast, visual reminiscence of Victorian America, with pictures of Lincoln and the Civil War

This article is an adaptation of Mathew Brady and His World, *about to be distributed by Time-Life Books. The book is by Mr. Kunhardt and his mother, Dorothy Kunhardt, grandson and daughter of Frederick Hill Meserve, noted collector of 19th-century photographs, and makes use of largely untapped Meserve resources.*

The story of Mathew B. Brady begins either in 1823 or 1824 (during an interview late in life Brady couldn't quite remember which). He did recall that he was born in Warren County, New York, in "the woods about Lake George" and that "his father was an Irishman." Numerous books and articles have pinpointed the year and place, and have then gone on to draw a picture of a bright, sensitive boy growing up and playing in the woods and fields where battles of the Revolution had been fought two generations before, but it is a fact that no records of Brady's birth or his boyhood have been discovered.

This lack of the most basic vital statistics is only the first problem in dealing with Mathew Brady's life.

Brady photograph of General Potter and staff, just before Battle of the Wilderness in May 1864, is unusual in that Brady joined the group (far right), and may have set off camera by release in his right hand.

Another is that Brady hardly wrote at all; he was imperfect at the art and kept away from it. There is no Brady autobiography, and no article by him in a journal of the times, saying something about his life's work. He never kept a diary. He seldom composed a letter, in most cases dictating the few he did attempt, and personally signing only a fraction of these. His assistants and accountants did all his bookkeeping and official correspondence. So the written record of Brady consists of occasional contemporary newspaper and magazine accounts of his achievements, an interview or two, some almost certainly unreliable recollections by distant relatives and brief mentions of him by some of the many subjects who sat for his cameras.

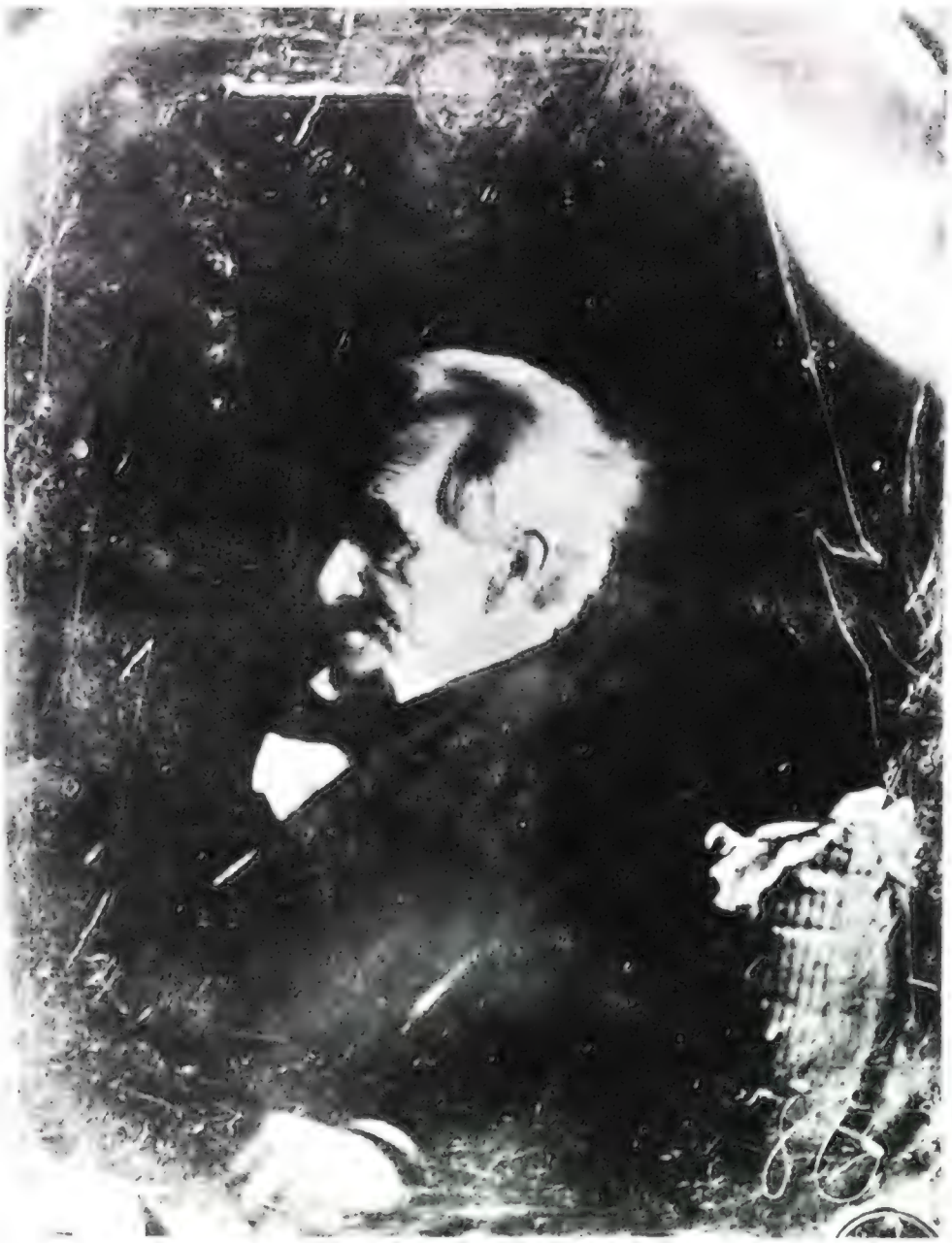
Most evidence of Brady's character and the extent of his achievements comes from appointment books, his own advertisements and published lists of photographs for sale, court records, bankruptcy proceedings, petitions to the government to buy his photographs, and occasional documents among government records.

As an old man, Mathew Brady recalled that he had come down to New York about the time photography was invented in 1839. He claimed to have learned the skill from Samuel F. B. Morse, the American painter, famed for his invention of the telegraph. While a professor at the University of the City of New York (now New York University), Morse and a colleague, chemist John William Draper, taught a number of young men how to make daguerreotypes.

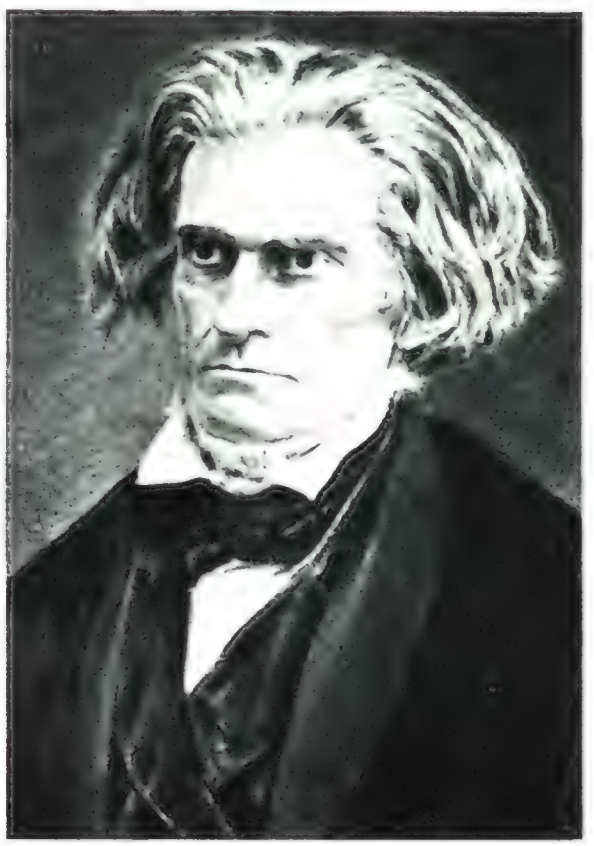
Brady's first job in New York was as a clerk at a mercantile establishment. By 1843, however, he was listed on his own in the New York business and residence directory as a manufacturer of jewelry cases. Soon he was making cases for surgical instruments and daguerreotypes as well. His specialty: miniature cases "with embossed top and extra fine diaframe." Alert, ambitious, easy at making new friendships, young Brady soon picked up enough knowledge of the daguerreotype process to open his own "Daguerrean Miniature Gallery." It was an instant success.

For a country boy from upstate, the city of New York in the early 1840s was not to be believed. It was dynamic, vigorous, undisciplined. Its more than 300,000 residents swarmed over ill-paved streets, along with free-roaming pigs, racing fire engines, horses and carriages, carts and clattering omnibuses. It was a

Dolley Madison, near 80, reveals little of her former bewitching beauty in this Brady daguerreotype.



"Brady" daguerreotype of a dying Andrew Jackson was probably really taken by friend, Edward Anthony.



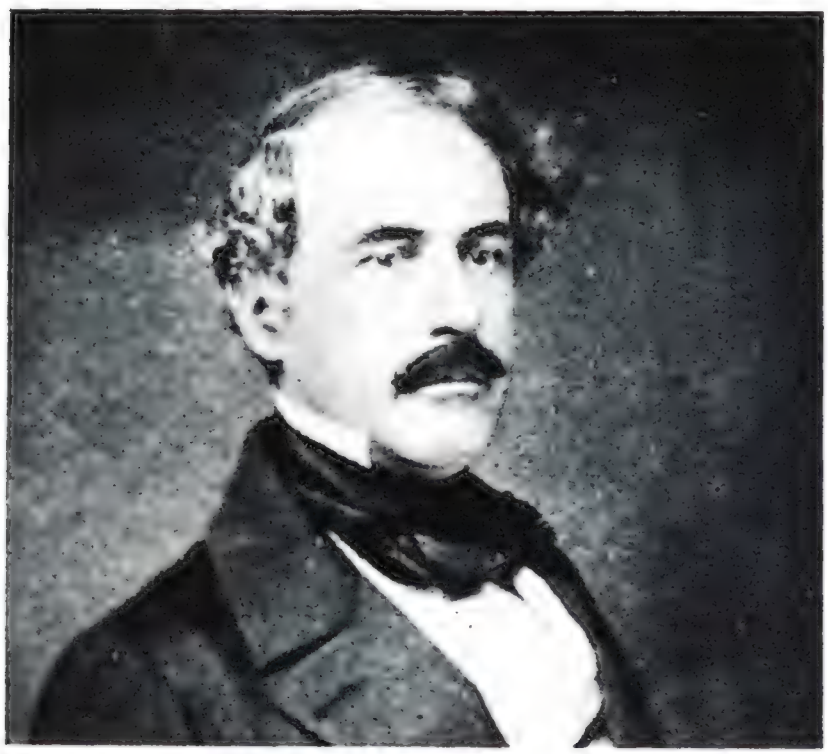
Nation's fate was debated by New Englander Daniel Webster, left, states' righter John Calhoun, right, and Henry Clay, the "Great Compromiser," here posing with his wife for someone other than Brady.

fast-growing, noisy, mercantile, island city half surrounded by docked sailing ships and fleets at anchor—a city of hotels and boardinghouses filled with visitors and businessmen from everywhere. Broadway was its grand avenue, stretching several miles north from the Battery Gardens, lined with everything from one-story wooden shops with plate-glass fronts to six-story brick emporiums. It was a city of excitement, luster, change, of growing prosperity and surging promise. It was a city with the perfect spirit to accept any exciting new industry. It would have been hard for a talented, hard-working practitioner like Mathew B. (for nothing) Brady not to have flourished.

A block from the Astor House—that "colossal edifice" which for size and comfort outdid even the palace hotels of Europe—and directly across from P. T. Barnum's American Museum, Brady's first gallery was three flights up in a skinny building just off the corner of Fulton and Broadway. Posing hours were between ten and three, and on dark days appointments had to be canceled. At an elegant gallery like Brady's, the charge for a cased daguerreotype was between three and five dollars.

Brady seldom if ever actually took any of his photographs. Like all the fancy daguerreotypists, he used "operators" to prepare the plates and work the cameras. Other assistants did the developing and mounting. This procedure seems strange today, when serious photographs are considered highly personal statements by a craftsman. But 130 years ago, in the time of long exposures and messy plates, a one-man operation was the rare exception.

Brady first photographed Lincoln at the time of his Cooper Union speech in 1860. The "master" adjusted the candidate's collar to shorten his neck, softened his features and thus helped him get elected President.



One daguerreotype equals two Robert E. Lees, thanks presumably to a Brady retoucher. Lee sat for

the one on the left about 1850. When he joined the Confederacy, he got imaginary uniform at right.

It never occurred to the proprietor of a gallery that he was not the photographer; he considered that the pictures were his and his alone. The operator was thought of as merely a mechanic, usually hired away from a rival studio for a few additional dollars and used like any piece of gallery equipment.

Camera operators came and went, as did mounters and retouch artists, but the quality of the portraits that came out of Brady's studio remained consistently excellent, earning him prizes from the first year of his operation. His daguerreotypes had a classic simplicity that gave them a strange, forceful excitement. The Brady daguerreotypes that are still in existence today, as well as the photographic copies of many that have been lost or destroyed, show a boldness, a directness of approach and an artful use of light that cause the characters of his subjects to shine through the delicate silver tracings. Even when his galleries adopted the ambrotype and, finally, the collodion glass negative process later in the 1850s, reducing the posing time considerably and making mass duplication and enlargement possible, the basic Brady portrait, before retouching, retained sharp, heroic simplicity.

Customers flocked to Brady's gallery from the beginning, but Brady decided early that he didn't want just "customers." By his second year of operation, he had concluded that if he could lure the rich and famous to pose for him, his future would be assured. And he would be performing an important service to America, which he loved dearly, by seeking out such giants as Webster, Jackson and Calhoun and making a museum of their faces for posterity.

Moreover, Brady was enough of a publicist to realize that each photograph of the Presidents, statesmen, visiting royalty, theatrical performers, financiers, preachers, high-ranking military officers and famous men and women of letters, put on display in his cases,

Senator James H. Lane of Kansas, a Lincoln friend, showed sentiments in 1861 by posing with weapon.

John Burns, 70, of Gettysburg, suspected the Rebels of stealing cows and joined battle against them.

would serve as an advertisement. His business would become self-perpetuating.

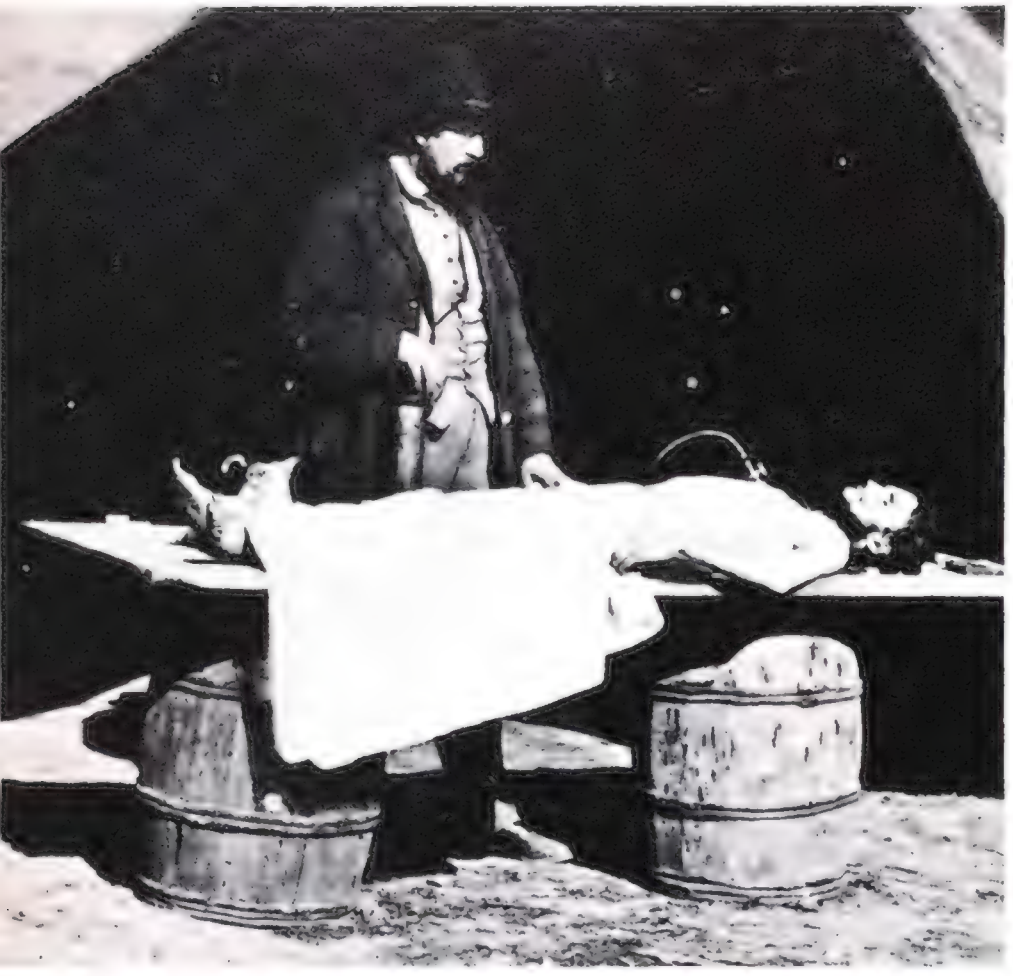
Brady conducted his studio-gallery as a massive picture agency. To keep his files active and satisfy his keen editorial sense, he concentrated from time to time on photographing different categories of people. Great statesmen would obsess him for a while, then beautiful women, generals and admirals, stage personalities, Congressmen, writers, foreigners and artists. By the early 1850s his collection of portraits of great Americans was staggering. Of course, some of the luminaries he advertised as being on exhibit—men like John Quincy Adams, Henry Wadsworth Longfellow and Andrew Jackson—were probably never photographed by Brady or his operators at all. As was the custom, he appropriated them from other photographers, usually copying them without permission. It is not difficult to conclude that he had little real pride of authorship and marketed the most appealing pictures, whether they were made in his galleries or not.

Yet the scope of Brady's collection was vast. It included Daniel Webster, New England's thundering orator; John C. Calhoun, the brilliant and thoughtful voice of the South; Henry Clay, the "Great Compromiser" who helped hold the Union together by persuasion; Dolley Madison, first of the great Washington hostesses; Commodore Matthew Perry, whose ships opened the ports of Japan to trade; William Cullen Bryant, poet of New York (SMITHSONIAN, March 1974); Horace Greeley, newspaper editor whose advice sent young men west; Horace Mann, inspirer of better mass education; James Fenimore Cooper, author of *The Leatherstocking Tales;* William H. Seward, Lincoln's Secretary of State; Senator Thomas Hart Benton of Missouri, and Presidents Martin Van Buren and James Buchanan.

A Presidential tradition: sitting for Brady

Although Brady relentlessly pursued the great in all fields, the Presidency was his special passion. For a half-century, the countenances of 17 Chief Executives, sometimes in office, sometimes not, became the cornerstone of his collection of American notables. At the end of his career, as the turn of the century neared and the Presidential sittings were granted to him out of courtesy to the long tradition, Brady's role had become sharply limited. His wife's nephew was the photographer, with the aged, almost blind master keeping in the background.

But at the height of his career it was Brady himself who knocked on the White House door, arranged the scenes and posed the subjects. He became so well known that Presidents did his bidding willingly, realizing that a picture with Brady's name on it would



Embalming techniques improved during Civil War as battle dead were prepared for shipment home.

Pitifully youthful, a Rebel soldier sprawls beside his rifle, unwittingly a perfect camera subject

find its way to the public either through sales in his galleries or by wood and steel engravings in the big newspapers and magazines of the day.

Of all the Presidents Brady encountered, Abraham Lincoln was undoubtedly his favorite, although the intense, wiry photographer was unimpressed when he first met the tall, spare prairie lawyer in the winter of 1860. It was election year, and Mathew Brady's personal preference for President was Stephen A. Douglas. But he photographed candidates of both parties and included Lincoln, who had been invited to New York to speak at Cooper Union.

The 51-year-old Lincoln stepped off the train looking disheveled and carrying a worn-out carpetbag with an ill-folded new suit inside. Two days later, on Monday morning, February 27, members of the Young Men's Central Republican Union picked him up at the Astor House, showed him the sights and took him to Brady's to have his picture taken. Brady remembered having a good deal of trouble with his ungainly subject. "When I got him before the camera, I asked him if I might not arrange his collar and with that he began to pull it up. 'I see you want to shorten my neck,' said Lincoln."

That was just what Brady had in mind: to make the candidate look more handsome and appealing than he actually was.

Brady, or the photographer in his Washington gallery, photographed Lincoln at least a dozen times after that. Working with collodion glass negatives now instead of the metal daguerreotype plate, Brady and his assistants also made an unparalleled collection of portraits of the people who surrounded Lincoln—his immediate family, cabinet members, close associates, his wife's friends and enemies, even one of the men who plotted his death. Lincoln and his world became a Brady industry.

As an old man, one of Brady's few joys was reminiscing about the Civil War and his part in the remarkable photographic coverage it received. But as so often happens when stories about the deeds of men are told too often, over too long a period of time, romance and exaggeration tended to creep into his tales.

"Did you have trouble getting to the war to take views?" an interviewer from the New York *World* asked him in 1891, five years before his death.

"A good deal," Brady replied. ". . . My wife and my most conservative friends had looked unfavorably upon this departure from commercial business to pictorial war correspondence; and I can only describe the destiny that overruled me by saying that, like Euphorion, I felt that I had to go. A spirit in my feet said 'Go,' and I went. After that I had men in all parts of the army, like a rich newspaper. They are nearly all dead,

for photography with its long exposures. Usually, such after-battle pictures were taken hastily. . . .

. . . But sometimes composition could be improved—a morbid task for a helper (seen at the far left).

I think. One only lives in Connecticut. I spent over $100,000 in my war enterprise."

The fact is that at one time or another more than 300 civilian photographers covered the actions of the Army of the Potomac alone; there is no count of those working with other Union armies or with the Confederates. Photography was being tested as a tool of warfare by the military of both sides: maps, plans and documents were copied at headquarters by camera and then quickly multiplied for distribution to ranking officers and the War Department. The Union Army's Quartermaster Department photographically documented whole battle areas into which commanders were moving so that they would be familiar, not only with the lay of the land, but also with existing facilities that could be turned overnight into hospitals, headquarters, mess areas and barracks. The Corps of Engineers ordered many views of bridges, train tracks and installations of all kinds.

These pictures were usually taken by specially assigned civilians. Few photographers had any official status, either in rank or in regular salary. And when they weren't working for the government, these cameramen joined other commercial photographers in the field who were making pictures of war scenes to be sold back home.

Mathew Brady was one of the commercial photographers—not the best, nor the most prolific, nor the most important. Nevertheless, he was by far the most famous. And he was one of the very first to have the courage and initiative to think of moving a miniature studio out into a combat area.

An anonymous daguerreotypist had taken several battlefield pictures during the Mexican War, and an English photographer named Roger Fenton, working out of a crude, horse-drawn van, had covered soldiers and campsites during the Crimean War in 1855. Still, the very idea of photographic war coverage on a grand scale was audacious, to say the least, in the 1860s. Brady helped lead the way and showed the rest of the world that it was possible.

His personal coverage was limited, usually to within easy range of Washington, and he certainly never had "men in all parts of the army." Maybe "like Euphorion" he felt he "had to go"—at first, but the spirit soon wore off. The endless, dusty roads, the corpse-strewn fields with their stench of death, the rain and the mud, the nights spent in the cramped darkroom-and-equipment wagon, runaway horses, smashed plates, frozen hands—to say nothing of the ever-present danger of being captured or caught by a stray bullet—all that was not for Mathew Brady. He preferred his comforts—his dapper doeskin pants, his merino vest, his silk scarf, his lavender water and At-

General Grant bends over General Meade's map at a Virginia churchyard, as staff officers rest on pews and 5th Corps wagons pause on road. Timothy O'Sullivan got this "candid" from high window.

wood's cologne, his favorite brandy—"Old Renault."

Brady was a starter, not a finisher. After 1861 he spent most of the war in New York, running his galleries there, but continuing to sink his money into battle coverage by other photographers. In his employ at one time or another during the war were Alexander Gardner, Timothy O'Sullivan, George N. Barnard, T. C. Roche, Guy Foux, James F. Gibson, E. T. Whitney, David H. Knox, John Reekie, S. F. Denny, Stanley Morrow, Louis H. Landy, John Wood, William R. Pywell, James Gardner and David B. Woodbury. It may have been, too, that an unheralded young black man named A. B. Foons, who often drove the wagon when Brady himself went out, also helped operate his camera.

Mathew Brady's definition of what made a Civil War picture a "Brady" was loose. It included any picture taken when the proprietor was on the scene—actually persuading a general to pose, requesting the wounded to be still for a minute, ordering gun batteries into different positions in order to improve the composition, helping the camera operator set up the equipment, framing the scene, running the show as he squinted through his thick, blue-tinted glasses. But it also included any picture taken by any photographer in his employ, whether Brady was around or not. And it came to include, as well, any war pictures Brady managed to buy, borrow, trade for—or copy.

So Brady's collection of war photographs soon became the product of dozens of different field photographers, some working under his commission, some not. The fact that he gave no credit to the actual picture taker and continued to insist that all photographs printed in his galleries carry only the credit "Photo by Brady" infuriated those who worked for him in the field. Many quit his employ. Alexander Gardner, who always insisted that it was he and not Brady who first thought of covering the war, had his fill early. By the winter of 1862 he had left, and by the following year most of the best war photographers were working for him instead of Brady. This did not seem to deter Brady at all. To him "operators" were expendable; there were always replacements around.

During this period, Brady must have lived high,

As men at war often do, these young Union officers, surfeited with bloodshed, bored with camp life, horsed around for a photographer—perhaps Alexander Gardner, who made similar pictures.

traveled hard, spared no expense—and in so doing he lost his equilibrium. His obsession with becoming the one and only complete pictorial historian of the Civil War drained him of his savings, land and investments and also distorted his vision. He ignored bills, putting off payment for hotel suites, food, fancy clothes—all the time ordering more and more chemicals and plates on credit.

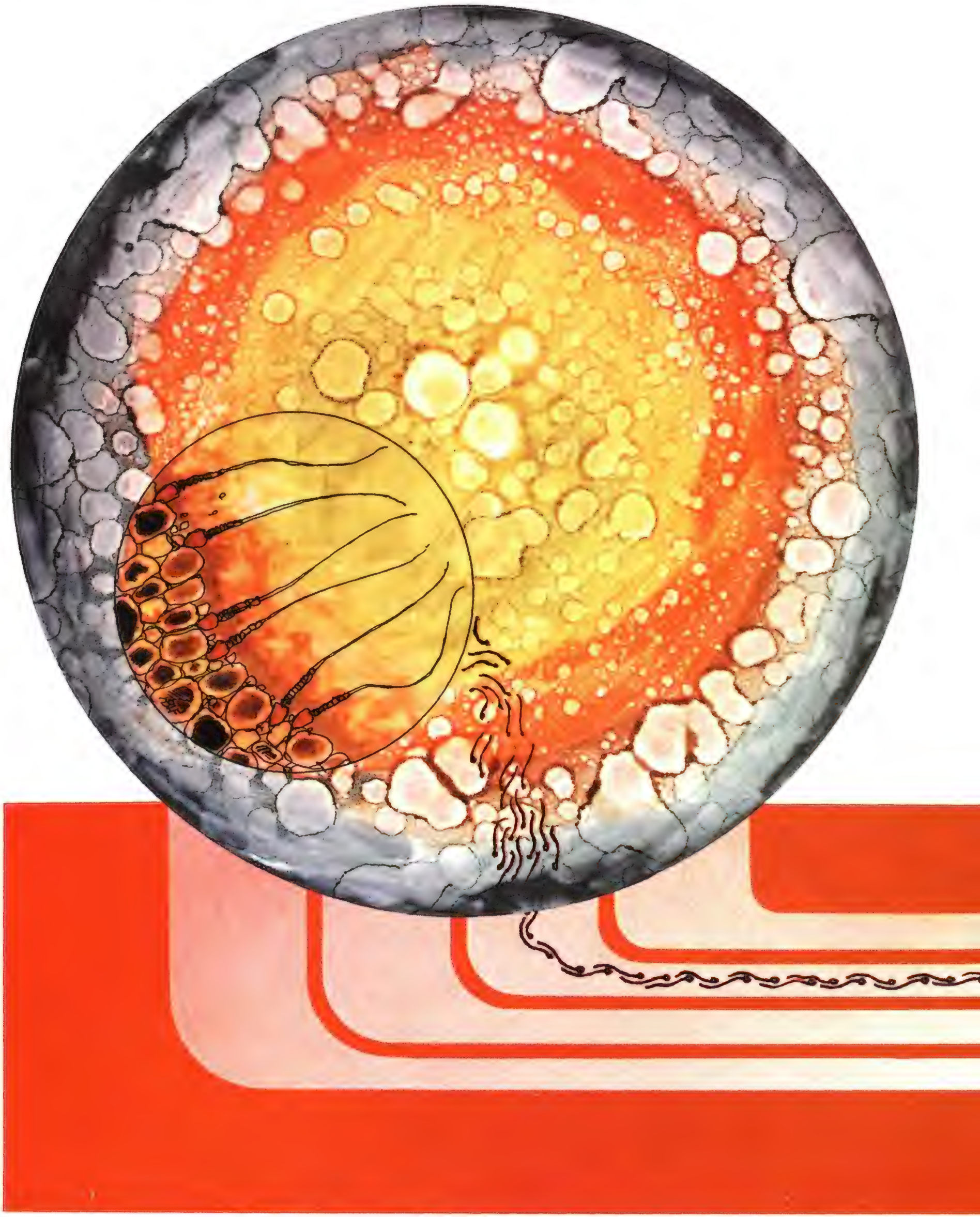
In July 1864, the first of many nonpayment suits was filed against him. Brady hadn't, it seemed, paid his gallery rent, his employees' wages, the bills from his major chemical supply house or even his personal debts. Bankruptcy proceedings followed in Washington and a few years later in New York.

He managed to sell his collection of war scenes to the government for $25,000 in 1875 in a complicated maneuver, but had hardly any of that windfall left after his debts had been paid off. Many of his contemporaries headed west after the war to break new photographic ground, but Brady stayed put, using his old portrait methods and techniques. Out of touch with such new developments as fast celluloid roll film and smaller cameras, a disillusioned, cranky and rheumatic Brady lived on well into the 1890s, going through the motions of the trade he had helped create.

It is not the sad end of Brady's career that interests us today; it is those exciting first decades when photographic technique was being created and exploited by the man who was the most important single force in the first generation of American photography.

Federal supply wagons flood through Petersburg, Virginia, so recently Rebel-held, to provision Grant's troops, now racing after Lee to end the war within days. John Reekie photographed this dramatic scene.

Next month: Tricks of the Trade



Myriad spermatozoa set out for distant egg: a 75-day journey for the embryonic sperm from seminiferous tubules of testis (above, left) via the lumen, shown schematically as one of four bars.

By Albert Rosenfeld

Controls on male fertility now seem within our reach

Ultrasound, autoimmunity and hormones promise a more timely, dynamic role for the male in effective contraception

Mr. Rosenfeld is science editor of Saturday Review *and author of* Prolongevity, *which was adapted for* SMITHSONIAN, *October 1976.*

The historical record is replete with nostrums for the prevention of pregnancy; indeed, the desire to thwart conception is almost as ancient and ubiquitous as the habit of promoting it. However, only with the advent of the first condoms for contraceptive purposes in the 18th century did any method ensure much better than chance results. From then on birth control became increasingly a male function.

The age of hormonal biochemistry has changed this pattern dramatically. Ever since the Pill, the female reproductive system has been the target of choice. The resulting oral contraceptive products, along with improvement in technical aids like the diaphragm and intrauterine device (IUD), have shifted the major responsibility, in this country at least, to the female. This outcome, it should be noted, was not imposed solely by men. One of the stated aims of the earlier feminist movement, as exemplified by Margaret Sanger, was to give women some control over their lives, since it was they who suffered the worst consequences of unwanted pregnancy and childbirth.

With the rise of the more recent women's movement, however, cries of discrimination went up. Among the milder complainants was Dr. Naomi Bluestone, a New York physician, who said in *Modern Medicine,* "Most researchers are men, and my subjective impression is that they feel more comfortable manipulating women's bodies rather than their own." Articles began to appear in journals bearing titles like "Contraceptive Research: a Male Chauvinist Plot?" It is certainly undeniable that the male reproductive system has not re-

At this stage, sperm are immotile, must be transported by liquid medium through a maze of some 800 tubules (circle), each microscopically small and tightly coiled to fit forward four-fifths of scrotum.

Illustrations by George Marsden—Great, Inc.

ceived anything like equal attention. Over a recent seven-year period, of the $35.8 million spent by the U.S. Agency for International Development on fertility research, only five percent went to male studies.

Feminist accusations probably account, in large measure, for the renewed interest in research on males. They also partially explain the growth of sterilization via vasectomy, though another factor is worry about the Pill's safety. But doctors are now concerned about vasectomy, too. Absorption of unejaculated sperm by surrounding tissue may stimulate the production of autoantibodies (antibodies against the self rather than against invading microorganisms) which could lead to complications. Dr. Albert Decker of the New York Fertility Research Foundation says that "increasing numbers of men now want their vasectomies reversed. Some have remarried and want to start new families. With some men, it turns out that fertility is closely tied to masculine identity."

Meanwhile, both industrial and university scientists have been developing mechanical on-off switches to make vasectomy unnecessary. Instead of cutting and tying off the tube, they seek to block it with a valve that can be opened whenever the host decides to become fertile again. These on-off devices have not worked as well for human subjects, however, as they did for experimental animals.

There seems to be a growing consensus among scientists in the field that a chemical or biochemical approach may be more productive, though the problems are substantial and the male system is hard to study because of the small size and intricacy of its parts. Recently I saw, magnified 10,000 times on the screen of an electron microscope at The University of Texas Medical Branch in Galveston, a minute portion of one of the seminiferous tubules of the testis, the male's living sperm factory. Clearly visible was a tadpolelike sperm cell, still a long way from maturity, clinging to a support extending from one of the cells that line the tubule's inner wall. "Colchicine, the drug I'm using, apparently doesn't affect the sperm itself," explains Dr. Bill R. Brinkley, cell biologist. "What it does is to cause that supporting 'arm' to let go. The sperm, left on its own, simply can't continue the maturation process. It dies and is resorbed into the surrounding tissue. One might say that the sperm, in its embryonic form, has been aborted."

Unfortunately, colchicine, commonly prescribed for gout, produces undesirable side effects. Nevertheless it remains, like other substances Brinkley has employed for the same purpose, a valuable tool for studying ways to inhibit production of spermatozoa. "A suitable male contraceptive," says Brinkley, "must not only be effective, but safe as well. And, while suppressing the male's fertility, it must not diminish his libido or potency. Nor must it have any noticeable feminizing effects, and it must be reversible."

Many substances have long been known to suppress sperm output. Some are addictive, some are toxic, some may raise the incidence of heart attack. Even the contents of the Pill would work on males, but at the cost of considerably reducing sexual desire and perform-

Sperm acquire motile capacity and fertilizing power in epididymis (left and circle), stand ready for moment of ejaculation. Enriched by seminal vesicles (above, right) and provided prostate carrier fluid

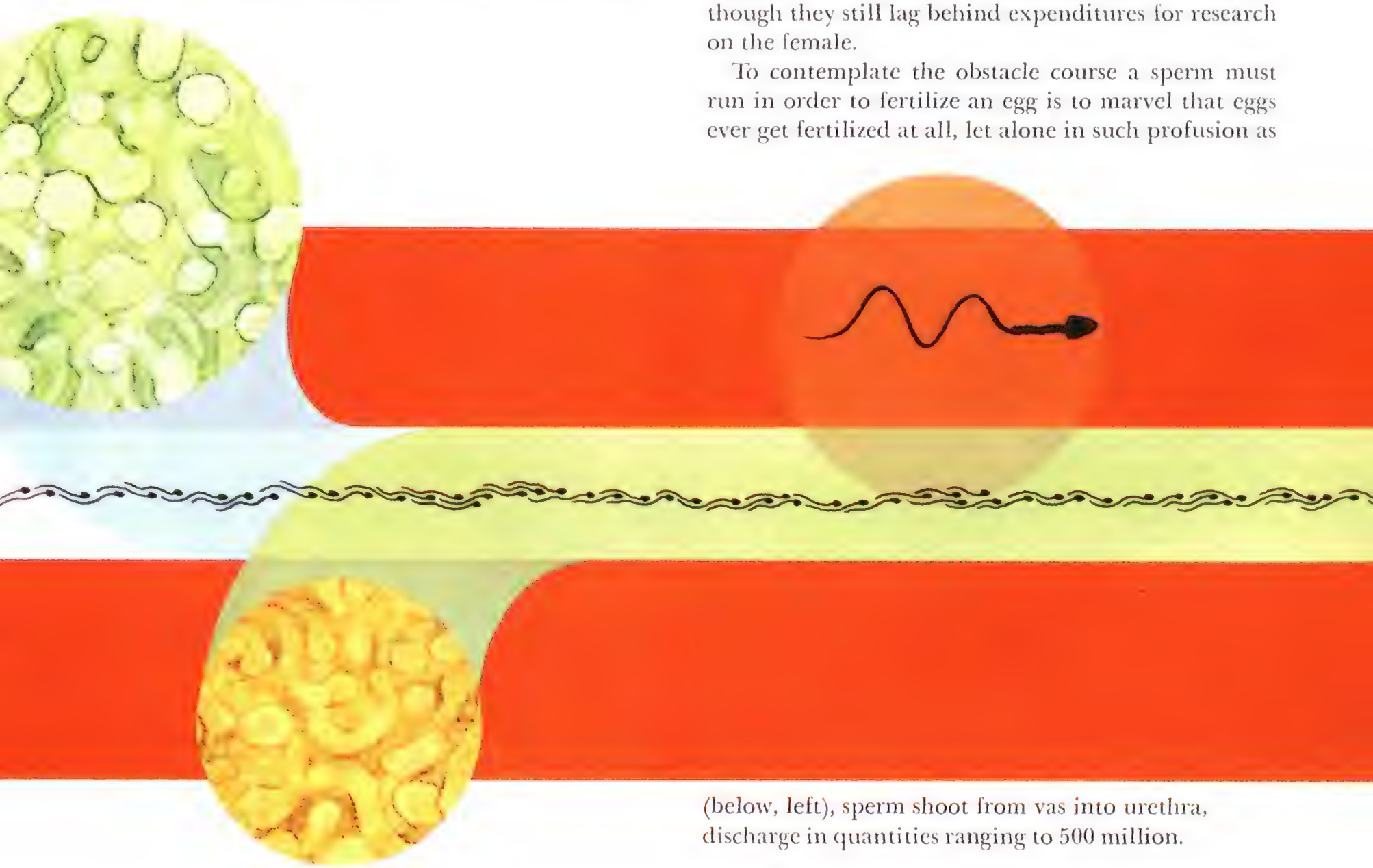
ance. One group of compounds originally useful in treating amoebic dysentery looked really promising for a while—spermatogenesis in prison volunteers went down virtually to zero with minimal complications, and rose back to normal within a reasonable period after treatment stopped. A serious flaw soon turned up, however: an incompatibility with alcohol. Even a partial drink of almost any alcoholic beverage would bring on a violent reaction, including vertigo, vomiting and blurred vision.

But there is better news ahead as we note the 300th anniversary of Leeuwenhoek's discovery of the spermatozoon. A recent surge of activity in laboratories around the world has turned up new substances and combinations of existing compounds that might well make it to the marketplace within a few years—sooner, perhaps, than improved methods for females may be found. Other promising approaches range from antifertility vaccines that could immunize a man against his own sperm to ultrasound applied directly to the testicles. Psychologically, the time seems to be ripe—a pioneering birth control clinic for men recently opened in San Francisco.

One reason why male contraceptive research has not been pursued more vigorously, says Dr. Emil Steinberger of the University of Texas Medical School in Houston, is that the male system simply has fewer "sites of vulnerability" than the female reproductive tract, which is much more complicated and spread out over a larger area, and thus is easier to interfere with at certain points. The ovaries usually release only one egg and only once a month, and at a predictable time of the month—whereas the testes are manufacturing sperm constantly, millions of them each day, all the way into grandfatherhood. Moreover, unlike the female, whose reproductive cells all have developed to the egg stage by the time of her birth, development of these cells in the male continues "throughout life and thus remains more vulnerable to genetic damage."

Dr. Robert Nes of Drexel University in Philadelphia believes the male hormonal system should not generally be tampered with because the male identity and sense of security are bound so closely to it. Most investigators have no such qualms, however, and the hunt is finally on in earnest for an acceptable male contraceptive. The Population Council's International Committee for Contraception Research has given high priority to the male apparatus, and the World Health Organization has established a special task force on new methods. Our own government has also made a substantial commitment to the task and funds for research on the male have risen steadily, though they still lag behind expenditures for research on the female.

To contemplate the obstacle course a sperm must run in order to fertilize an egg is to marvel that eggs ever get fertilized at all, let alone in such profusion as



(below, left), sperm shoot from vas into urethra, discharge in quantities ranging to 500 million.

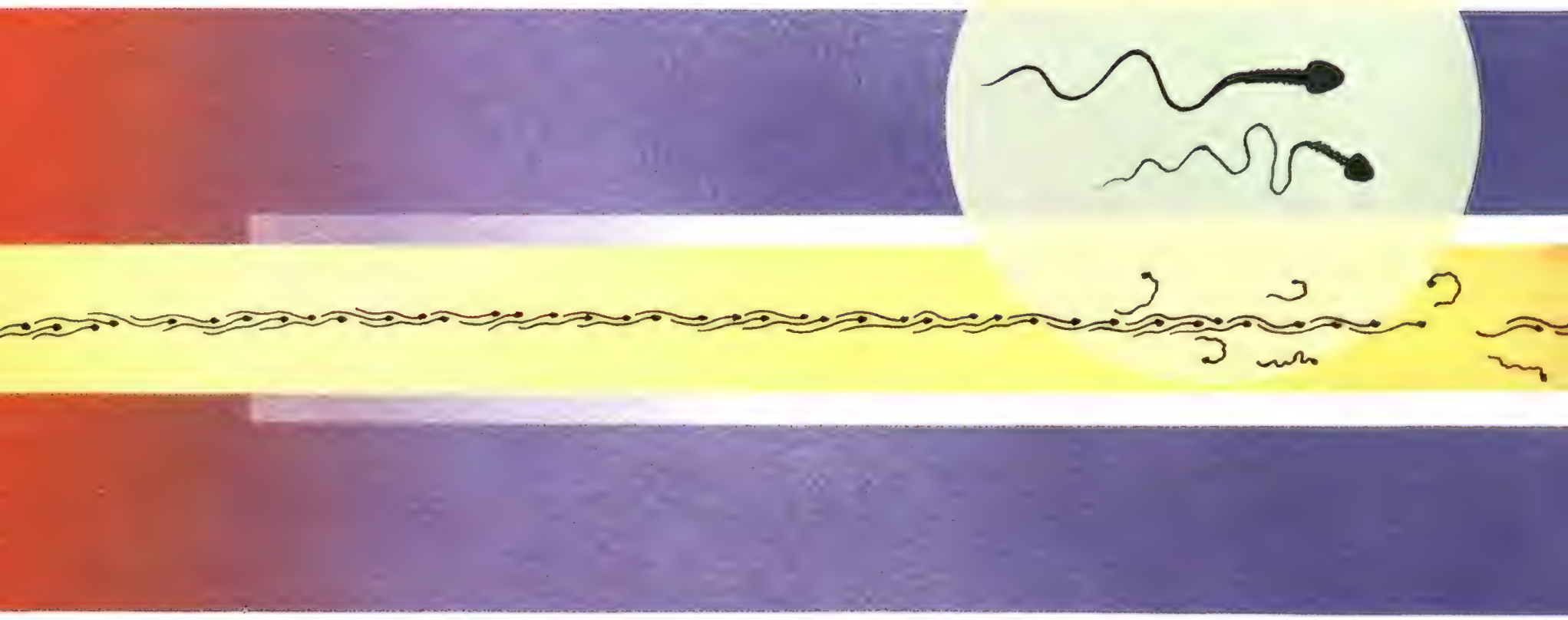
to compound a demographic crisis. It takes about 75 days for an embryonic sperm to make it all the way from the wall of the seminiferous tubule, up between the Sertoli cells, out into the lumen—the tube's hollow central space. At that point, it is almost but not quite mature. It must still get through the tubule's convoluted maze and on to the next phase of its development. There are some 800 of these tubules, tightly coiled so they can fit into the restricted space allotted them. The lumen is almost invisibly narrow, and if all the tubules of a single testis were unraveled, stretched out and placed end to end, they would extend across several football fields.

The sperm in the lumen cannot yet propel itself—the tail is still immotile—so it must be transported by tubular secretions and myoid cell contractions, along with millions of its brethren, through conduits that lead to the epididymis, which occupies the rear portion of the scrotum. The epididymis is a closely packed, coiled duct about 20 feet long, though microscopic in diameter. Here the sperm completes its maturation, acquires its motility and its final fertilizing capacity, and is held in storage to await the moment of ejaculation.

Ejaculation takes place via the vas deferens—the tube that is cut and tied off in vasectomy—and the urethra, the passageway through the penis, but not until the sperm cells have been fortified by the contributions of the seminal vesicles and the prostate gland. Once ejaculated, a sperm enters the acidic environment of the vagina, which may be partially offset by the alkalinity of the semen. If it surmounts this first hurdle, it must then make a long journey across the uterus and survive the junction of the uterus and the Fallopian tubes, where, in some mysterious manner, immotile or otherwise unfit sperm may be rejected. Finally, those sperm that remain must swim upstream against the flagellating, hairlike cilia that line the tubes' walls, and also overcome peristaltic motions that are propelling the egg downstream. About half ascend the wrong tube. Eventually, a few hundred sperm approach the egg.

But the egg is hard to get at. It is surrounded by protective layers, including a clear zona pellucida and a layer of cumulus cells. Fortunately, the sperm's head is encased in a cap called the acrosome, which, as it butts against the egg, releases powerful enzymes that begin to disperse the cumulus cells and ultimately allow penetration of the zona. However, the first sperm to reach the egg is seldom the winner of the sweepstakes. Dozens, perhaps hundreds, must unleash their acrosomal contents before one can fight its way through. In response to the first penetration, new barriers go up to prevent the entry of any further contenders. Which sperm wins is apparently a matter of pure happenstance.

A single ejaculation of a fertile human male may contain as many as 500 million sperm, to make it possible that a few will be strong enough to reach the goal.



Sperm must wend their way through vagina (above), negotiate uterine cervix (right), traverse uterus to Fallopian tubes (far right) where nonviable candidates are rejected. Survivors swim upstream

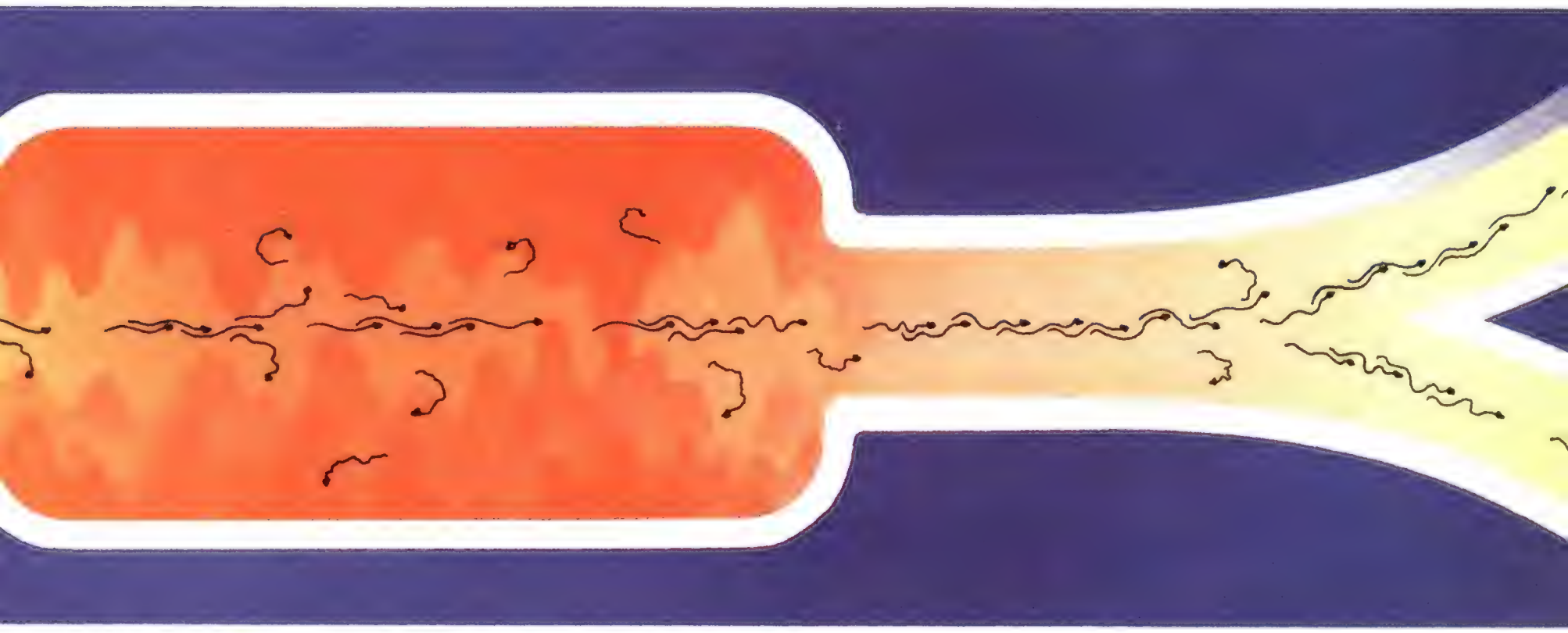
Any given sperm has a substantially smaller chance of fertilizing the egg than the potential offspring has of becoming President of the United States.

After ejaculation, some time must elapse before a new load of completely fertile sperm is ready in the quantity normal for a given male. Masters and Johnson have now and then had to advise couples troubled by infertility that the male was simply not waiting long enough after copulation to let his sperm build up to his maximum fertility level. A warning, however: high-frequency sex activity is not in itself a reliable means of contraception.

In any event, it is clear that the male system is vulnerable at a number of points. The hormonal approach, so successful in female contraception, is a natural place to begin. In the midst of the seminiferous tubules—but outside them—lie the highly specialized Leydig cells. They manufacture testosterone and release it into the bloodstream. But they do so only when the pituitary releases the luteinizing hormone (LH), once thought to be purely female in nature because of its role in stimulating ovulation. There exists between the two hormones a feedback loop, wherein the pituitary automatically turns off its secretion of LH when the amount of testosterone in the blood reaches a certain critical level.

While this circulating testosterone is important in terms of secondary sex characteristics—a man's deep voice and hairy chin—it plays no major role in spermatogenesis. For that purpose the hormone must be retained locally, and in much higher amounts than in the bloodstream. This local concentration of testosterone is attributable in part to the presence of a special androgen-binding protein (ABP), which is made by the Sertoli cells inside the tubules. And they are induced to make ABP by a second pituitary hormone, identical to the follicle-stimulating hormone (FSH) that makes the female's eggs mature. If the flow of this hormone could be controlled, there might not be enough protein to bind the testosterone, and the Leydig cells could make quantities of it without stimulating the testes to manufacture a single sperm.

One paradoxical approach being tested by Dr. Steinberger and his Houston group is the use of testosterone itself as a contraceptive. The trick is to keep enough of it circulating in the bloodstream to prevent the pituitary from releasing normal levels of LH, thus suppressing the capacity of Leydig cells to make testosterone locally in sufficient quantities for sperm production. Steinberger has obtained highly favorable results with a group of 17 volunteers, who get regular booster shots of the male hormone, and he is even beginning to study the use of testosterone in capsule form. Meanwhile, Dr. C. Alvin Paulsen and his colleagues at the University of Washington School of Medicine in Seattle have enjoyed very encouraging initial success with a synthetic hormonelike substance called Danazol. Because it also reduces sexual desire, Paulsen administers some synthetic testosterone, which not only brings libido back up to the norm but suppresses spermatogenesis even more effectively. (The method is too expensive for general use now.)



against combined forces of cilia, peristaltic motion.
Fifty percent of male cells ascend the wrong tube.

An especially promising nonhormonal approach has been developed at Purdue University by Dr. Roy L. Whistler. The testes' sperm-manufacturing capacity is directly dependent upon the quantity of certain kinds of sugar their tissues are able to absorb and metabolize, especially D-glucose. Whistler has employed a product that mimics it, called 5-thio-D-glucose, and it appears to produce few serious side effects. In mice it completely shuts off spermatogenesis, but the results may not be reversible, and interference with glucose metabolism may generate undesirable consequences elsewhere in the body. Beyond the testis itself, a number of techniques are being explored: discovering and disrupting the epididymal processes which bring the sperm to final maturity, rendering sperm immotile, tampering with the chemistry of the seminal fluid so that sperm will be more vulnerable in the vagina, and keeping the acrosome from forming properly or fracturing it prematurely.

Also under active consideration are a number of immunological approaches, which may make a man "allergic" to his own sperm. In response to infectious microorganisms or transplanted tissue, the immune system manufactures antibodies which attack specific antigens, proteins on the invading cells that stand out like enemy flags. According to Dr. Warren R. Jones of the Flinders Medical Centre of South Australia, at least 30 antigens have been identified in human semen, and it has been demonstrated beyond doubt that the male does make antibodies against certain sperm antigens. Even an antisperm vaccine for women is being actively researched after a lapse of 40 years, but an effective vaccine for men appears unlikely in the near future because of possible genetic damage, injury to germ cell tissue or autoimmune reactions.

A few investigators place their hopes on a direct approach that takes advantage of male anatomy. If the testes were inside the abdomen, the few degrees difference in temperature would make spermatogenesis impossible. Indeed, a group studying birth records in Galveston, Texas, discovered many fewer conceptions in summer than in winter; they also found that drugs which injure the testicles of young rats do more damage in hot weather than in cold. Finally, it has long been known that hot baths and tight pants cut sperm production, but scientific variations on these effects have proved unreliable.

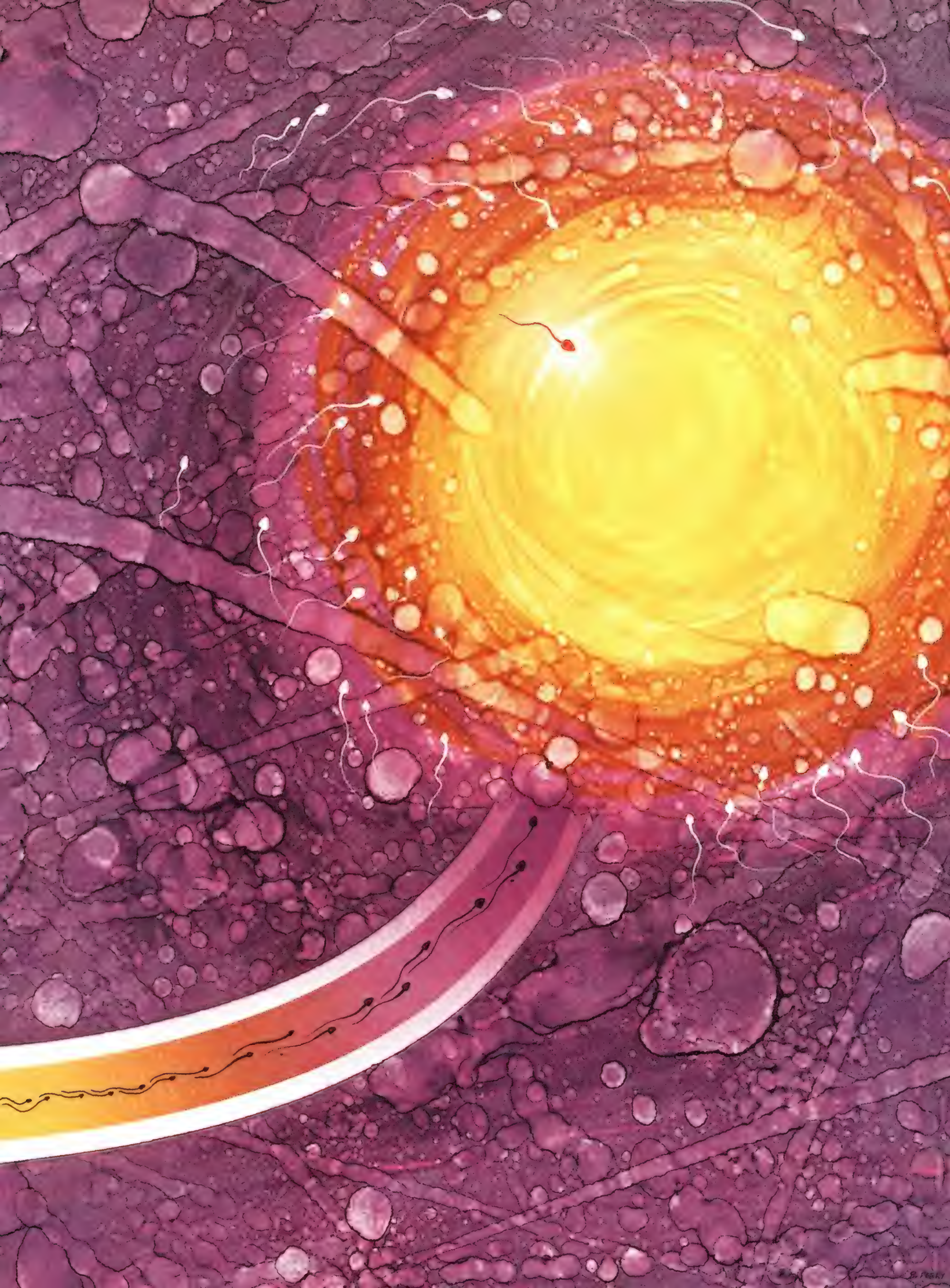
Some real excitement has been generated by the experiments of Dr. Mostafa S. Fahim and his associates at the University of Missouri-Columbia School of Medicine, who raise testicular temperature by means of ultrasound. For the last few years they have been giving small, safe, controlled doses of ultrasound to rats, dogs, goats, cats and monkeys, and have successfully induced totally reversible infertility without loss of libido or potency, and with no important side effects. Safety and efficacy in human males remain to be proved, but Fahim is optimistic. He believes that ultrasonic waves do the job not merely by raising temperature, but also by directly influencing the molecular behavior of certain compounds.

Isn't ultrasound too unwieldy a technique for so delicate a task? "Not at all," insists Fahim. "This method will be utilized by family planning units or family doctors. It is inexpensive, painless, requires no surgery and takes no longer than ten minutes. It will also be socially acceptable and practical in underdeveloped countries." Fahim has already designed a simple sit-on apparatus for doctors' offices, and even envisions an ultrasonic contraceptive device as a standard bathroom fixture. The effects might be programmed to last anywhere from three months to life.

How soon can we realistically expect any of the male contraceptive drugs or devices now under investigation to reach the market? "There is no way we can put a date on it with any certainty," declares ever-cautious Dr. Gabriel Bialy of the National Institute of Child Health and Human Development. "If we're very lucky, four or five years. Allowing, however, for the usual obstacles and delays, it would be safer to say from eight to ten years."

One thing is certain: in a liberated age like ours, a whole spectrum of options should be available, labeled His and Hers, so that husbands and wives can share both risks and benefits of population control.

Target egg is enveloped by cumulus cell layer. Sperm cap releases enzyme to dissolve cumuli, permit penetration of zona pellucida. The combined assault of hundreds lets one push inside, fertilize egg. Aim of male fertilization control is to prevent this.



A Tudor-styled triumph, the manor house of Yaddo stands inviolate within 400 acres of leafy grounds, unperturbed by the nearness of the famous Saratoga Race Course (top) beyond barrier of woods.

By William F. Claire

Where artists do as they please—and, mostly, work

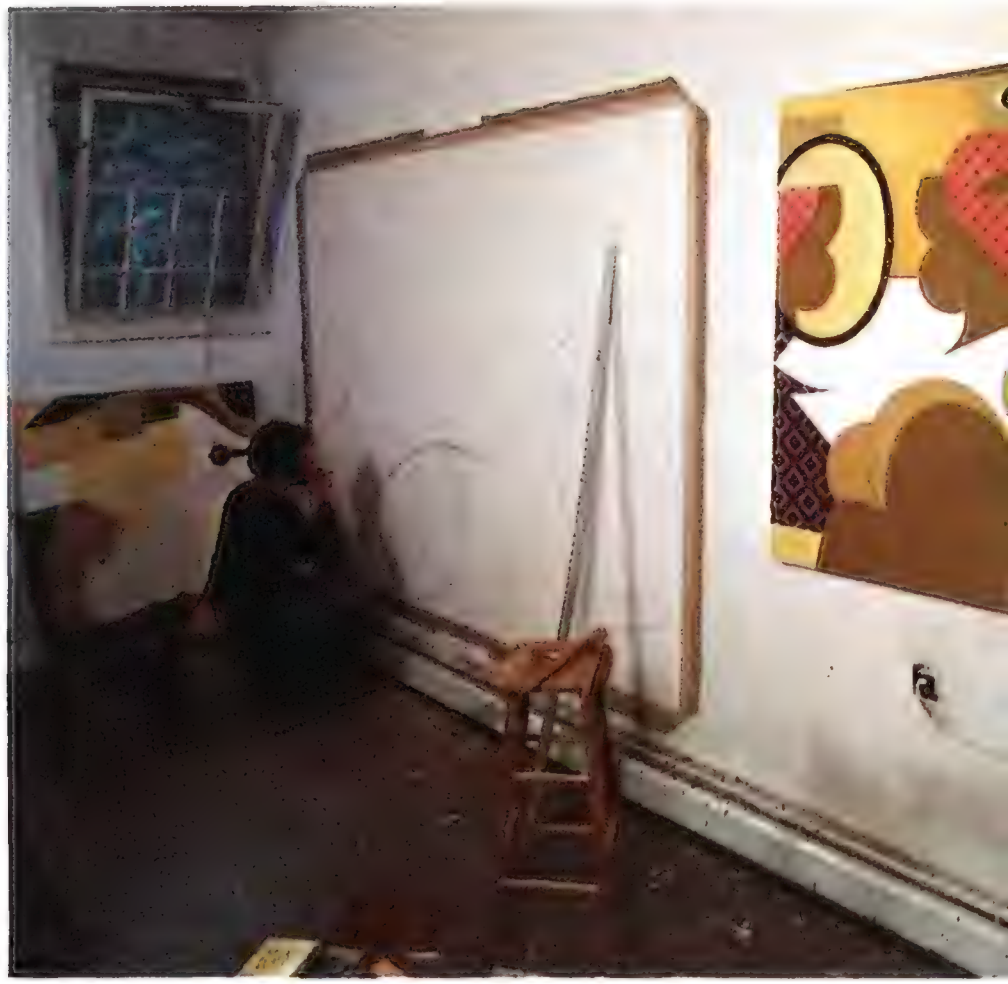
Rambling over hundreds of acres, Yaddo and MacDowell are private enclaves where creative people are tyrannized only by art

Anticipating her first visit to Yaddo, one of two principal retreats for writers, artists and composers in America, the shy, reclusive Carson McCullers, who later completed *Ballad of the Sad Café* and other works within its confines, forecast her surroundings as "an emotional Shangri-La and literary Mecca." McCullers intuitively surmised what hundreds of novelists, poets, painters and other creative artists have experienced when given a rare opportunity to escape telephone and television, demands of domestic and professional life, the myriad details of daily existence—for an atmosphere and setting of which the principal purpose is to provide invited guests with time and space to create new works of art. A novelist writing a fictional account of the retreat called it "Illyria." Others, many famous and those knocking on the door of significant achievement, have often evoked a kind of mythical kingdom to describe what is so frequently sought, but rarely attained, in our fast-paced, often-frantic society.

Yaddo (pronounced to rhyme with shadow), near the venerable racetrack in Saratoga Springs, New

At MacDowell Colony, in Peterborough, N.H., artist Gina Gilmour strolls through forest on one of the retreat's tranquil roads. It is along paths like this that artists' cabins are located.

Photographs by Richard Howard



A studio at Yaddo; time and space at hand, away from it all. Here, painter George Parrino.

Two writers, Nora Sayre and Norma Rosen, chat in baronial splendor of Yaddo's Grand Hall.

York, and MacDowell, in rural Peterborough, New Hampshire, each covering more than 400 acres, have established formidable records of continuity and accomplishment. Several newer colonies, ranging from the promising Millay Colony for the Arts on the sweeping 600-acre former "Steepletop" homesite of Edna St. Vincent Millay in Austerlitz, New York, to the Ossabaw Island Project off the Georgia coast, have similar goals. But the two pioneering prototypes are Yaddo and MacDowell, and it is within their varied surroundings that many memorable works of American art have been produced.

Last summer, Yaddo, without any fanfare, celebrated its 50th anniversary as a working community, and MacDowell will be approaching its seventh decade since its founding by the eminent American composer, Edward MacDowell, and his wife Marian in 1907. Yaddo's present site, which dates back to a farm operated by a Revolutionary War veteran who fought at Bemis Heights and Saratoga, was purchased in the 1880s by a remarkable American philanthropist, Spencer Trask, who financed many of Edison's early experiments and who also helped preserve the natural springs present in the Saratoga region. With his nov-

Poet William F. Claire is the Washington representative of the State University of New York.

At home in another corner of Yaddo's very grand Grand Hall are two obviously relaxed guests.

The stone tower studio, situated on one of Yaddo's four ponds, is a favorite retreat for composers.

elist wife, Katrina, who, after his death, married family friend George Foster Peabody, he envisioned retaining his Tudor-style mansion and grounds so that future artists and writers could work in harmonious surroundings. Four years after Katrina Trask's death in 1922 the Yaddo plan was put into operation.

When the early death of Edward MacDowell stunned the music world in 1908, his wife Marian began what was to become a lifetime commitment to the colony. It was largely through her efforts that the former 70-acre farm in southern New Hampshire became the MacDowell of today. She barnstormed the nation every winter for some 40 years until the late Forties, giving concerts in memory of her husband, raising funds, and developing a national constituency for the colony in the form of MacDowell Clubs in many cities. After her winter tours were over, she supervised the construction of roads and cottages on the property, thinking always of producing the kind of contentment for other creative artists that her husband found. (He once claimed his creative efforts tripled during visits to Peterborough.) She was, according to MacDowell's executive director, Conrad S. Spohnholz, "an indomitable lady with unusual charisma."

Writing a quarter-century ago in his *Autobiography,* the famed poet-pediatrician William Carlos Williams described the atmosphere at Yaddo as "somewhat that of a cloister, but completely secular: a big old mansion in the style of an English country house where . . . writers, painters, musicians and sculptors are invited to come for visits among pine forests, lawns, a formal rose garden of an acre or two in graded terraces to write, paint, or whatever it may be, at their ease." A similar feeling exists at the less formal MacDowell, where no studio is in sight of another. Guests mingle in homely surroundings, with no imposing edifice, and it is rare that any other than the natural sounds of the country are heard. Despite subtle differences in style and tone, however, the objectives of both retreats are essentially the same, and it is in the individual studios, cottages and hideaways where a major part of the day is spent by the guests, many of whom are or will become leading figures in the world of literature, art and music.

It was in "one of the barniest of bedrooms" in the West House at Yaddo that novelist John Cheever, a frequent Yaddo guest and member of the board, wrote recently that "when one says that there is no room quite like it anywhere else in the world, one is not speaking of the number of windows (20) but of the world of poetry, fiction and music that have been composed here." Cheever, an outstanding American novelist and writer of short stories, believes that "of all the societies, fellowships, institutes and clubs

One of MacDowell's varied studios, the Adams. Note lunch basket left quietly at doorstep.

Hillcrest barn, on MacDowell's spacious grounds, provides studio space for sculptor Blanche Dombek.

Composers Daniel Brewbaker (pink shirt) and Jack Gottlieb relax in MacDowell's Savidge Library.

aimed at encouraging the intellectual community none has been so successful as Yaddo in selecting gifted men and women by a jury of their peers and furnishing them with the best practical condition for work in the company of their kind." And Thornton Wilder, who is said to have used Peterborough, New Hampshire, as a setting for *Our Town,* paid the highest tribute to MacDowell when he said, "I came here when I had published nothing at all. Oh how I needed to hear myself think."

A typical colony day unfolds with life kept as simple as possible. The only "rules" are that guests, if they want breakfast, show up at a particular time and the same is true for dinner. After breakfast at Yaddo, residents pick up their preselected lunch in a regular lunch pail and a Thermos jug and go off to work. At MacDowell, a picnic hamper is deposited at the door of each individual studio at lunch time. During the day, no artist disturbs any other artist at work.

The retreats give guests a sense of pride and justification for their often lonely pursuits. A young woman poet at Yaddo cannot fail to be moved if she is sitting in the same chair in which Sylvia Plath wrote while describing vivid scenery outside the same window. Similarly, a poet might be assigned Edwin Arlington Robinson's studio at MacDowell and meditate on *Monadnock through the Pines,* a subject of one of the old master's poems. In listening to a composer like Gerald Busby or Ned Rorem play the 19th-century Steinway in Yaddo's music room after dinner, a guest might reflect that Theodore Roethke, Robert Lowell, Langston Hughes, Virgil Thomson, Milton

Members of the MacDowell staff preparing wicker lunch baskets for delivery to studios' steps.

Writer Nicholasa Mohr, author of children's books, at her typewriter in quiet of the "New Jersey" studio.

Avery and Flannery O'Connor also enjoyed such impromptu concerts after work. In the communal hours during and after dinner, painters get to know poets, musicians talk to sculptors; all share common experiences and develop lasting friendships.

At Yaddo, both Curtis Harnack, whose latest work, *Under My Wings Everything Prospers,* a short novel and six short stories, has just been published, and his wife, the novelist-short story writer Hortense Calisher, set a "working mood" that pervades the Yaddo grounds. No one looks over anyone's shoulder at either retreat, and this underlying feeling creates the kind of ambience necessary for creating new works of art.

It is that kind of ambience that Leonard Bernstein sought when he was working on his *Mass,* and why he came to MacDowell. Such disparate writers as Willa Cather, Mark Harris and James Baldwin have found working space in the same New Hampshire hills, as have Sheila Burnford and Joy Adamson. Some 32 Pulitzer prizes have been awarded to former MacDowell residents, seven of whom are musicians, and some of whom are better known for writings on contemporary affairs.

Curtis Harnack has referred to Yaddo as offering "the possibilities of concentration no other place in the world affords these days; day after day of opportunity and no interruptions." He understands the fragile balance required to keep Yaddo in its natural state, despite inflationary cycles that outpace endowments and increasing costs that the Trask family could not have imagined. By the end of 1976, there had been more than 3,000 visits to Yaddo by some 1,500 guests (writers make up the majority, followed by visual artists, composers and others). Additionally, some 6,000 public visitors a year stroll amid the grounds of the formal Rose Garden, devised in 1899 and laid out and surveyed by Spencer Trask, in which every year a portion of the nearly 1,000 roses needs to be replaced. Both Harnack and his MacDowell compatriots (headed by Board Chairman William Schuman, the composer) have many plans for their famous retreats—basic and essential plans for continuing their services without altering the nature of their mission. The needs range from Yaddo's desire to modernize certain studios, install better plumbing facilities, and build a sculpture studio for artists working with metal as well as a photography studio, to MacDowell's similar need for a sculpture studio, a film studio and a complement to its Savidge Library (built by local craftsmen and the scene of many spontaneous happenings) that could display works by their visual artists.

While America builds more and more centers for the performing arts, and many groups seem caught up in an endless "workshop" mania of symposiums and discussions about the arts, it is the solid work done in the retreats—without any formal programs—that will engender many of the plays, compositions and literature of the future. The eventual benefits of, for example, the work done by more than 200 artists in a year at MacDowell (on an average stay of 46 days and a maximum of three months) is of course incalculable. But we may be certain, based on past accomplishment and present quality, that they will be substantial.

Admission requests to the retreats are increasing.

Pool, Ping-Pong, convivial company in the easy hours after dinner at the MacDowell Colony.

Yaddo's applications, with revolving committees of peers in each of the arts making careful selections, have doubled in the past five years. MacDowell has noticed an increased number of applications by women artists in the past five years and in 1974, for the first time since World War II, there were more women than men in residence.

The dream of two families in the early days of this century has become, in actuality, a living testament to the creative spirit, and will continue to be demonstrated in concert halls, in theaters, in new art shows and in the privacy of millions of homes where people even today still read.

Perhaps in a time of increasing complexity and bewildering technological change, these havens for artists and writers represent our best hope for the continued vitality of the republic of arts and letters. For they continue to be places where the best of our creative and artistic talents "write, paint, or whatever it may be, at their ease." While speaking specifically of Yaddo, the writer Daniel Fuchs summed up the situation when he said, "Despite its imposing appearance, Yaddo is an exception to the museum psychology pervasive in our Alexandrian society, which prefers to venerate culture rather than experience it. Harmoniously, Yaddo reconciles the monumental and lived-in, the gilded age with the contemporary, retaining its character over the years as a retreat of distinction."

That both Yaddo and MacDowell have retained their character through the chaotic years of this century is a circumstance in which everyone interested in our cultural development can take enormous pride. They have retained their character in both a physical and spiritual sense by nurturing and preserving the land on which they exist, and by creating the environment for continuing creative accomplishment. After a year given to celebrating uniquely American attainments, Yaddo and MacDowell, in their quiet, yet marvelously productive ways, should be at the top of those lists that pay homage to American institutions of true and lasting significance.

Yaddo's East Room where Carson McCullers wrote. Shown here is her biographer, Virginia Spencer Carr.

By S. Frederick Starr

Russian Revolution: a wall-sized history

S. Frederick Starr is Secretary of the Kennan Institute for Advanced Russian Studies, Woodrow Wilson International Center for Scholars

Where can one see the most ambitious attempt to portray, by means of a work of art, the entire history of the Russian Revolution? Moscow? Leningrad? Kiev? Hardly. It is—a whole wall of it—at the Hirshhorn Museum in Washington. The work—part painting, part sculpture, part drawing, part collage—is the creation of the exuberant American artist Larry Rivers. Now on permanent view for the first time, it has been raising eyebrows since its creation 12 years ago.

Rivers' tableau is anything but modest. Spanning the entire century from Austria's Prince Metternich to Joseph Stalin, its approach is interdisciplinary. In this single 32.4 by 14.3 foot construction, one encounters a parade of philosophers, statesmen, poets, czars and revolutionaries—all visually orchestrated so as to indicate graphically their relation to the Russian Revolution of October 1917.

It is a story of epic heroes and epic villains. But more impersonal forces also find a place in Rivers' conglomerate narrative. Interspersed with the gallery of mighty leaders are the Paris Commune of 1871, World War I and the Russian Civil War, Russia's Cultural Revolution of 1928-31, and the forced industrialization fostered by the first Five-Year Plan. In short, Rivers has concocted a kind of *War and Peace* transliterated into today's art.

The Russian Revolution relies heavily on specific verbal concepts rather than on abstract images. The tableau should read, from left to right, like a book. Beginning in Germany with Marx and Bismarck and passing through the Russia of Czar Nicholas II, the major events in the history of Russia's revolutionary era are arranged in neat columns. On the right side of the work the historical narrative culminates in the rise of Stalin and the tragic suicide of the "Poet of the Revolution," Vladimir Mayakovsky. This is the "text" that the individual panels present and elucidate. It is hard to imagine that the verbalization of art could be taken much further!

Rivers' construction reverberates with the avant-garde spirit of postwar New York, an explosive time of which he was very much a part. Rather than the careful style that so bookish an undertaking might seem to call for, Rivers relies on the spontaneity and sweep of action painting. Thus, familiar images of czars and revolutionaries are rendered in a quickly sketched but assured shorthand, as if to suggest the chaotic series of events in which Nicholas II and Lenin figured.

In a storm, the Russian novelist Turgenev wrote, the highest and lowest leaves of a tree touch one another. Similarly, in Rivers' *Russian Revolution* high and low art are side by side. Stenciled names appear hard by formal portraits.

A rusting machine gun suffices to indicate World War I, a few pipes stand for Stalin's first Five-Year Plan, and a wooden cutout of a pistol conjures up Mayakovsky's suicide. Looming above this motley composition is a carefully rendered Moscow skyline, a formal stage framing the welter of events below.

Although relying on the techniques of its own time, Rivers' *Russian Revolution* is nevertheless a continuation and development of an earlier era of art history. Historical narrative painting was enshrined as a mainstay of European academism for a century after the French Revolution. In the 1930s it emerged anew with the rise of agitational and rhetorical mural painting. Rivers' work is a salute to the long-neglected tradition of Diego Rivera and Thomas Hart Benton.

Not propaganda but evocation

But Rivers' *Russian Revolution* is by no means a work of propaganda. Rather, it is a romanticized evocation of a utopia that never bloomed. Born in the Bronx to immigrant Polish parents, Rivers grew up in a world in which the names of Lenin, Bukharin and Stalin were household words. On every side he encountered those who knew Trotsky as Lev Davidovich, and who had experienced his fall from power as a crisis in their own lives. Later, when Rivers read Isaac Deutscher's monumental biography of Trotsky, the old pantheon came to life once more.

It is, then, a record of history as it is remembered, and not necessarily as it was. But what about Rivers' patrons? Did they not object to his project, as the Rockefellers did when Rivera altered the original sketches for his Rockefeller Center mural to include the figure of Lenin? With only himself as patron, Rivers had no such problems. He could blithely ignore the fact that his work corresponds to no orthodoxy, whether of the Right, Left or Center. Protected by his own benign patronage, it is scarcely surprising that Rivers produced an epic work that is as personal and idiosyncratic as one would expect from this volatile and enthusiastic one-time jazz musician.

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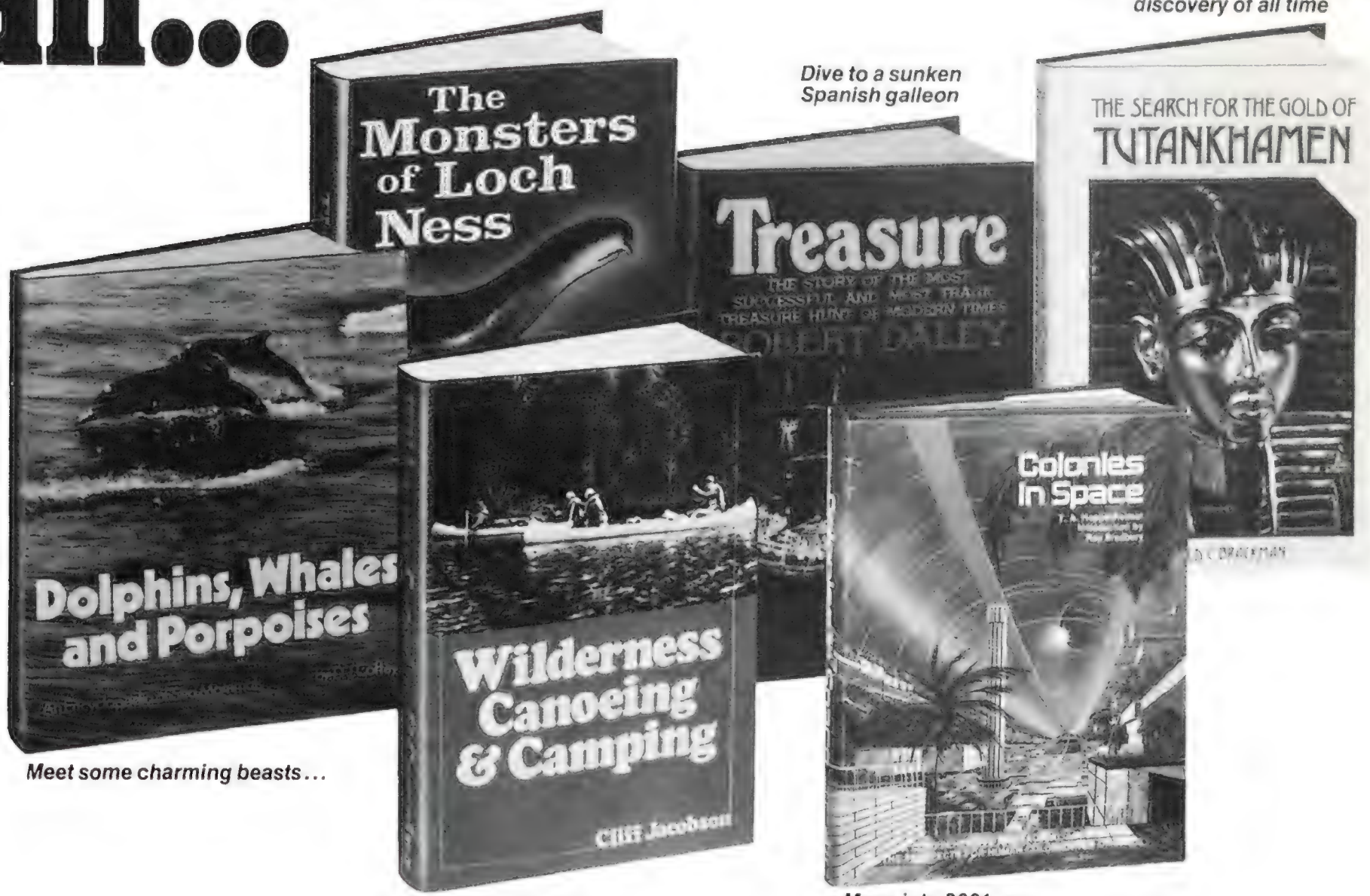
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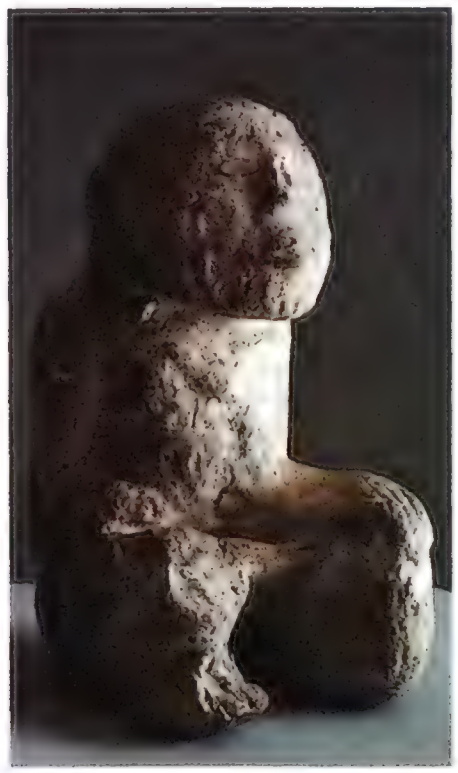
By George F. Dales

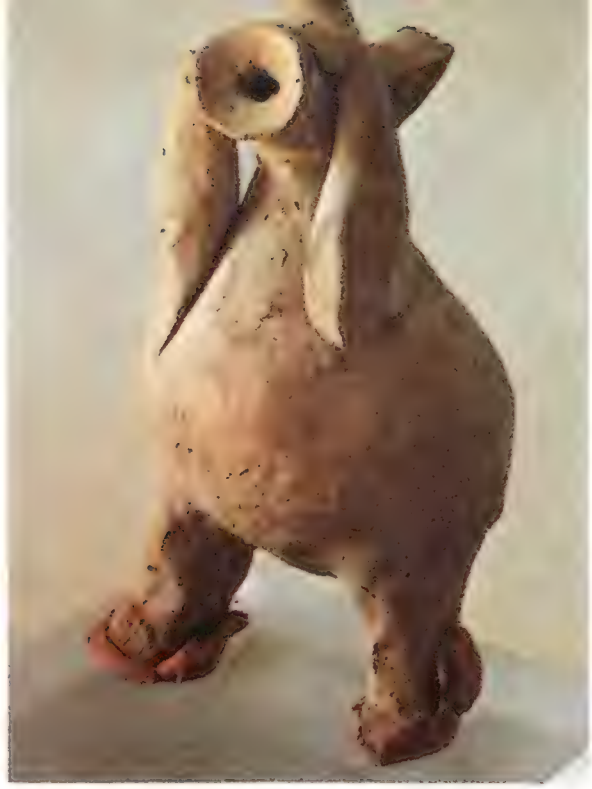
Strange relics of the crumbling, still-puzzling Indus culture



Without a key to our 20th-century languages, how will archaeologists of A.D. 6477 know what to make of a 1977 fire hydrant buried in 45 centuries of rubble? Or a birdbath? Or a yellow Rolls-Royce?

That is our problem today with the plethora of artifacts and art objects dug up recently at various sites in the Indus Valley. We have not deciphered the language of the people who lived 4,500 years ago in what is now Pakistan and western India. So we don't know what to make of such things as a conical piece of ceramic *(above)* that looks like the hub of an airplane propeller. Or a stone bird *(far right)* that looks like a penguin (penguins in Pakistan?). As the pictures on these pages show, the objects are well-wrought and beautiful—but cryptic. Some were fashioned by city folk and some by country dwellers. The works of both, and the urban and rural environments in which they lived, are fascinating challenges.

Attempts to rescue what urban and rural builders and artisans constructed 4,500 years ago have a high international priority



Our vantage point for viewing ancient Asian civilization has been traditionally the city—the massive remains whose sheer bulk captivates the imagination of the searching archaeologist.

These dusty mounds of long-spent human endeavor can stand as high as 100 feet above the present ground level, and, like cultural icebergs, have their massive bases submerged 20 or more feet in thousands of years of alluvial deposits and windblown sand.

The city, by definition, can be expected to contain the most concentrated, uniform, sophisticated aspects of an ancient culture—monumental architecture; major works of arts and crafts; physical symbols of the social, economic and intellectual lives of the inhabitants; and, very likely, archives, both official and private, of written documents. Small wonder the archaeologist's spade—like a cultural divining rod—has led expeditions to concentrate on urban sites.

Photographs by Dmitri Kessel

Excavation sites in dotted area show known extent of Harappan civilization in Pakistan and India. Some, such as Balakot, probably were seaports; others, like Mohenjo Daro, were built on Indus and its tributaries.

But the view of a civilization from the city alone is incomplete and distorted. Thus excavations at smaller village or provincial sites often can provide valuable and fascinating new perspectives.

A striking example of this urban-rural contrast is seen in the greater Indus Valley of Pakistan and western India. There, in the 1920s, were discovered and excavated two impressive urban ruins of a previously unknown and unexpected ancient culture. Harappa, in northern Pakistan, and Mohenjo Daro, in the northern part of Sind in southern Pakistan, were heralded as twin capitals of a 4,500-year-old civilization that dominated the vast Indus plain from the foothills of the Himalayas to the Arabian Sea.

A single enigmatic, seven-inch fragment of a sculpture gave rise to the theory that this ancient empire was ruled by a priest-king. Equally mute architectural remains prompted interpretations of sacred baths, priests' colleges and state granaries. One need only visit Mohenjo Daro, or look at its layout, to be impressed by the remarkable organization and planning that resulted in a mile-square city—the size of Hoboken—with its main streets forming a general grid plan, and all the brick buildings oriented almost uniformly in north-south, east-west directions.

Turbaned Harappan clay figurine, 4,000 years old, has headcloth wrapped around mouth as dust shield.

Unknown people, unknown language

The nature of those early excavations, and the publicity they received, was such that the ancient Indus—or Harappan—civilization was rigidly stereotyped as a model of the world's first monolithic priest-king-dominated state, characterized by a technological and artistic uniformity enduring virtually unchanged for a thousand years. A grim, monotonous, uninviting human societal experiment indeed, if it was really true. And our attempts at a better interpretation are made more difficult by the fact that the Indus script, of which we have thousands of short examples on stone seals, metal objects and pottery, never has been convincingly deciphered. Nor has the language family it belongs to even been positively identified. We are confronted by the mute remains of an unknown population speaking an unknown language—and for years I, among others, have looked in vain for some Rosetta Stone to unlock the mystery.

Herein lies the real challenge for the handful of present-day archaeologists who have the opportunity to conduct fresh excavations at sites of this most ancient of South Asia's fully developed urban civilizations. But the pace of new research has been excruciatingly slow. In India only two Harappan towns have been excavated extensively—Kalibangan, in northern Rajasthan, and Lothal, a seaport in Gujarat. In Pakistan the principal sites of Harappa and Mo-

Present-day inhabitant of Mohenjo Daro area wears the same kind of headcloth to filter out dust.

Public sector of Mohenjo Daro was a fortified citadel built on a platform elevated 20 to 40 feet, where

henjo Daro (map, p. 58) have been excavated intermittently since the 1930s, principally by the British archaeologist Sir Mortimer Wheeler. There also has been one season of excavation at Mohenjo Daro in 1964-65 by a University of Pennsylvania expedition directed by the author (supported by a grant from the JDR 3rd Fund). Another American excavated at Chanhu Daro, in the southern Indus Valley, in 1935-36; a French team excavated extensively at Amri, also in the southern Indus Valley; and a Pakistani team excavated the village of Kot Diji—some 40 miles east of Mohenjo Daro.

Starting in 1973, two American expeditions, funded in part through the Smithsonian Foreign Currency Program and the National Science Foundation, have had the splendid opportunity to work at new sites in southern Pakistan. Dr. Walter A. Fairservis jr. of the American Museum of Natural History in New York has been excavating Allahdino, a unique small Harappan settlement a few miles east of Karachi. The University of California at Berkeley has completed four seasons of excavation at the coastal site of Balakot, some 55 miles northwest of Karachi. Both excavations are providing some fascinating comparisons between the highly organized, crowded cities and the remotely situated smaller settlements near the southern seacoast of Pakistan.

This opportunity for excavating provincial sites has come during an otherwise discouraging lull in Indus civilization archaeology. Apart from some important exploratory surveys in northern Baluchistan and the deserts east of the Indus, conducted over the last few years by Dr. Rafique Mughal of the Pakistan Department of Archaeology, no new archaeological work is being done currently on Harappan sites in either India or Pakistan.

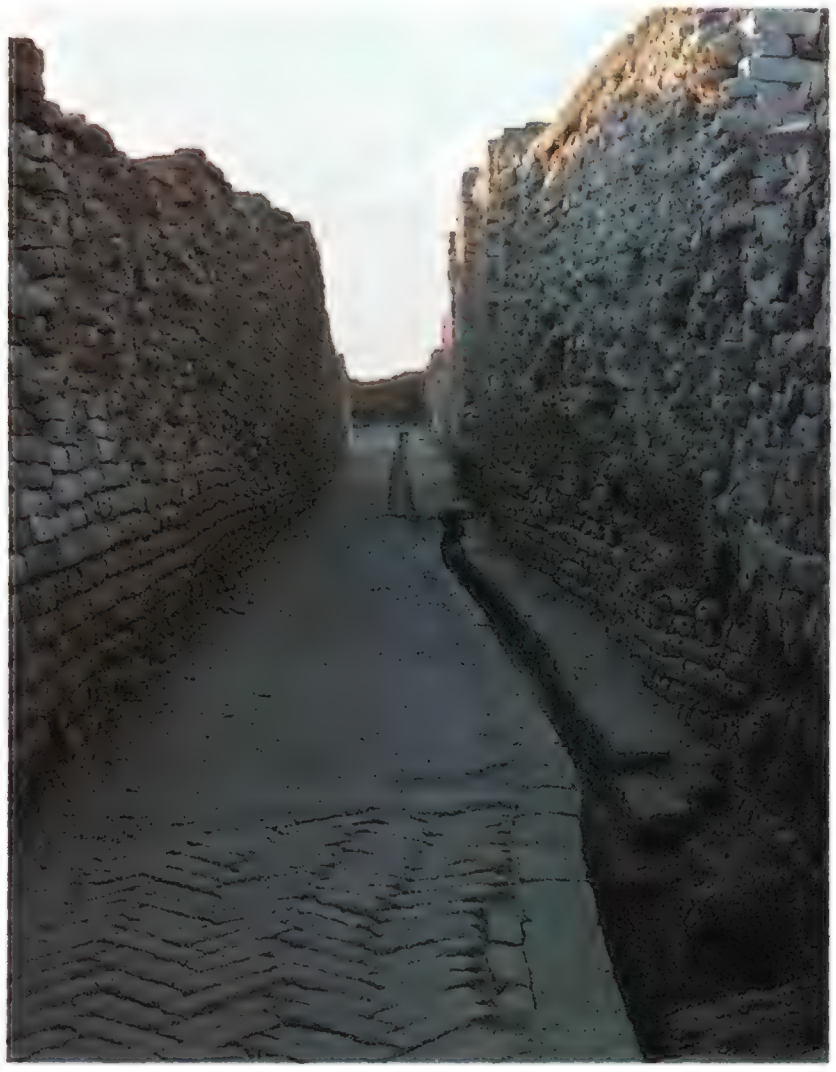
Top priority is being given the crumbling remains of Mohenjo Daro. The hundreds of brick structures literally are disintegrating before our eyes. The culprit is salt, which permeates the brickwork, and as the degree of moisture fluctuates—several times a day—the salts follow an inexorable cycle of crystallizing, expanding and dissolving, each movement weakening and crumbling the exposed brickwork. In another 20 to 30 years, the exposed walls may be in total collapse.

This naturally has been a matter of concern for decades, but it was only in the 1960s that positive steps were taken by the government of Pakistan to determine the causes of the problem and to implement corrective measures. A direct appeal was made to UNESCO to study the situation. As a result, a master plan for attacking the problem of salt-caused decay was presented, together with an elaborate scheme for restoration of the monuments and development of the site as a tourist attraction.

Basically, the master plan directs its attention to problems created by the waters—both underground and floodwaters from the Indus River—which constantly moisten the ground and the brickwork, facilitating the capillary action said to be responsible for depositing the destructive salts in the brickwork. The present water table—artificially raised as the result of extensive canal and irrigation projects—is close to the ground. In 1964 we encountered it at about 15 feet below the surface of the plain at the base of the Mo-

bathing pool and possibly chief priest's house have been excavated. Elevation (left) is later Buddhist stupa.

Brick toilet in residence area had running-water drain. It is one of only two found so far in the entire city.



Brick-lined street drains run through same section. The walls show how salts are eating away at structures.

Great bath in citadel is 39 by 23 feet, eight feet deep. Layers of baked brick and asphalt made it watertight.

henjo Daro mound. Deep drillings made the same year showed that the early levels of the site go down at least 40 feet below the present plain level. Thus about one-third of the remains at Mohenjo Daro are buried not just in sand but in water!

The master plan calls for lowering the water table by installing, in stages, two concentric rings of tube wells (p. 63) around the site. Pakistani engineers estimate that ultimately the water table can be lowered to 65 feet and maintained at that level. The plan also calls for building a gigantic earthen barrier to divert the waters of the Indus away from the site. But the estimated costs for all this have soared to somewhere between $7.5 and 10 million, just for installing and implementing the first phase of the work.

Two other factors may complicate the Mohenjo Daro problem even further. Both concern the *sources* of the salts. Windblown sands and dust are proving to be major transporters and depositors of salts. Thus Mohenjo Daro may be experiencing daily downpours of windblown salts which will pursue their destructive course irrespective of the ground and floodwaters.

Even more insidious, and virtually impossible to

Workmen sweep Mohenjo Daro's main street, a 30-foot roadway running north and south through city.

combat, are ancient salts incorporated in the bricks when they were manufactured 4,500 years ago. These dormant destroyers are activated by present-day exposure to groundwaters, floodwaters and rain. But again, in spite of the obvious desirability of protecting the site from the inordinately high groundwaters, the salts will continue their relentless destruction of the brick structures.

Decisions will have to be made—and made soon—if anything enduring is to be salvaged from the rapidly deteriorating remains of Mohenjo Daro. If the entire site cannot be saved, at least selected areas could be dewatered, the salt leached from the walls, restorations made and truly preserved for future generations.

The University of California Balakot project originated through the author's long interest in the question of maritime activities of the Indus folk, especially as they might involve trade and cultural contacts with the Persian Gulf and the Sumerians and Babylonians of Mesopotamia. My wife and I, guided by Dr. Mughal, conducted a survey of the barren Makran coast of Pakistan in 1960, searching for evidence of ancient coastal seafaring activities. Two massive fortified sites of the Indus culture were visited, now miles inland because of the steady rise of the coastline, but both apparently important outposts protecting the adventuresome merchants who plied the treacherous coastal route between the Indus and the Persian Gulf.

Because of security considerations, permission never has been granted to conduct excavations at either of those sites. But the identification in 1960 of yet a third ancient coastal site by a British hydrologist-cum-archaeologist, Robert L. Raikes, set the stage for our eventual opportunity to excavate Balakot.

The seven-acre site of Balakot, rising 25 to 30 feet above the cultivated plain, is about seven miles from the present sandy coastline of Sonmiani Bay. The rate of sedimentation and sand deposition in this region is astonishingly rapid, so the distance from the sea does not preclude the probability that the site in 2000 B.C. was very near the coast, and also near the mouth of the Windar River, which itself has shifted its bed several miles to the east and south of the site. The western half of the site is a high, steep-sided mound dominating the lower half of the settlement.

The functions of the various structures on the high mound are unknown. In most instances, only the foundations of walls remain, so that we cannot uncover rooms intact with furniture in place. But floors are excellently preserved and we have excavated numerous rooms with perfectly preserved storage jars and stone and brick drains. It appears that the structures on the western high mound are not common domiciles. The walls, some almost three feet thick, and the formality of the layout bespeak public or perhaps administrative buildings.

Our lack of positive information on social and political organizations is amply compensated for at Balakot by other types of discoveries. Most plentiful of the finds is the pottery. Hundreds of complete or restorable vessels and hundreds of thousands of pottery shards have been excavated during the last four years.

One large, well-preserved pottery kiln was discovered, associated with several smaller kilns in which were found clay figurines of bulls—the humped species common to much of South Asia today. Bull figurines (no cows) are ubiquitous at Harappan sites, and Balakot has yielded a fine new collection which will pro-

vide interesting comparisons with the big-city varieties from Mohenjo Daro.

One of the major aims of the Balakot project, apart from the traditional search for architecture, ceramics and artifacts, has been to collect floral and faunal remains that will help us reconstruct something of what the physical environment was like when Balakot flourished four to five thousand years ago. And the remains are plentiful indeed—more than 20,000 specimens of animal bones, teeth and shells were collected just this last season of work.

Richard Meadow of the Peabody Museum at Harvard has the enormous job of identifying and describing the mammal bones. Preliminary sorting in the field reveals that the Harappans were butchering cattle (zebu), water buffalo, goats, sheep and, more rarely, gazelles and pigs. Fish bones and shells of gastropods and bivalves indicate another basic source of food for the Harappans. Most of the varieties are still caught and collected in the estuarine waters of Sonmiani Bay and off the coast in the Arabian Sea.

One of the fascinating discoveries is the evidence of large-scale and intensive exploitation of marine resources by the Balakot Harappans. In addition to collecting for food, they also gathered huge quantities of shells—mostly of the species *Meretrix casta,* a clamlike bivalve, and less frequently a large conch shell. These two types of shells provided the raw material for what appears to have been a local industry.

Beautiful bangles for Balakot women

Manufacturing areas complete with grinding stones, hammer stones and shells in all stages of working have been found. The principal product was shell bangles for the personal adornment of the Balakot women and probably small girls, to judge from the sizes of the bracelets. The majority of these beautiful items of jewelry were manufactured from the *Meretrix* shell by a tedious process of alternate grinding and chipping. This process has been studied and re-created by one of our student staff members, Jonathan Mark Kenoyer, using the ancient tools themselves.

Attention also has been directed toward recovering evidence of the flora present at Balakot during the Harappan period. Carbonized seeds and endocarps (the innermost layers of seed covers), as well as casts and impressions of leaves, stems and seeds in bricks, pottery and other clay objects, provide the basic evidence for the ancient plant life.

Thus our observations and preliminary studies give a picture of a sophisticated, well-to-do, self-sufficient coastal village retaining rigid ties with the Indus cities, especially Mohenjo Daro. The specific reasons for sites such as Balakot (and the two other Harappan sites on the Makran coast) having been established in such isolated locations can only be inferred from the mute evidence. It is significant that these three Harappan coastal sites are approximately one day's sail from each other and that there are no known similar sites farther inland along the coast. Physical proof of formal trade with the Near East has not been forthcoming from our excavations, with the exception of a few examples of Persian Gulf-type painted pottery. But how else does one explain the location of these sites if not as outposts intentionally located to facilitate and protect coastal commerce? Sumerian and Babylonian cuneiform documents describe extensive long-distance seafaring ventures, presumably into the Arabian Sea, in this period.

Regrettably, the Harappans have not left us such convenient evidence. But we know from excavated raw materials that must have been imported from outside the Indus Valley, and from the far-flung distribution of Harappan sites, that the Harappans were very active in the exploitation of distant resources. Most astonishing in this regard is the recent discovery by

Water gushes from experimental tube well dug to lower level of groundwater that is dissolving ruins.

At Balakot, by lamplight, Janet Lee Koss and Thelma Lowe, students from Berkeley, study Indus pottery.

Author at camp. From the University of California, he recently was a visiting scholar at Cambridge.

Mrs. Barbara Dales, her husband's assistant, sorts shards of pottery uncovered at the Balakot excavation.

French archaeologists of a mature Harappan settlement up in northeastern Afghanistan, close to the Russian border. The discovery and excavation of such frontier sites adds exciting dimensions to the picture of Harappan civilization that the major cities, such as Mohenjo Daro, cannot provide.

Balakot has yielded other new insights—totally unexpected when we began work there in 1973—into a long period of human occupation going back centuries before the arrival of the Harappans. The lower and earlier portion of the mound of Balakot was built up from virgin soil to a height of more than 22 feet by the successive dwellings of some obscure folk known to us only through the discovery of their exquisitely manufactured and colorfully painted pottery, their distinctive clay bull figurines, their flint tools and grinding stones, their stone beads and mud-brick houses. Radiocarbon dates, and the stratigraphy of Balakot itself, suggest that these early Balakotians dwelt there around 3000 B.C. and that they, for reasons we do not know, abandoned the site long before the arrival of the Harappans.

No primitive savages were those unnamed earlier folk. In addition to their remarkably developed ceramic industry, there is evidence that they were using copper. Furthermore, the architecture excavated this past season displays a standardization of mud-brick sizes, construction techniques, and regularized orientation heretofore considered to have been introduced into South Asia by the Harappans. The study of these new finds is just beginning, but it already fires the imagination. It has, circumstantially, added importance because of the unlikelihood that any other site of comparable age and cultural affinity will be excavated in Pakistan for years to come.

Thus the Balakot expedition, including the 16 students and specialists who have participated in the excavations and our two representatives from the Pakistan Department of Archaeology—Mohammad Siddique and A.A. Farooq—justifiably can feel satisfied with the results of these four often difficult and trying seasons of work.

Now the final and most important phase of the project is beginning: the sorting, classifying, analyzing, comparing, drawing and preparing the thousands of bits of raw data for publication. The mute potsherds, the brick walls, the butchered animal bones and the mass of other cultural debris must be made to reveal what insight they can into the life and times of South Asia's earliest civilization.

Pakistani workman at Balakot with large Harappan storage jar surrounded by stones, one a used grindstone.

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DRIVE ONE OF OUR LEGENDS

PORSCHE
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By John Russell

Out of nowhere, he became the top art dealer in Paris

Ambroise Vollard: a 'one-man show' honors the impresario, first to celebrate and display his friends, the greatest artists of his age

Ambroise Vollard (1868-1939) was one of the most remarkable men ever to have sold a picture. He may well have run the most successful single-handed picture business in the entire history of art. To have given the first one-man shows to Cézanne, Picasso and Matisse sets a special standard of achievement that very few of his colleagues—previous, present or future—could rival.

Now Vollard himself is being given a "one-man show," in an exhibit devoted to the dealer as impresario, the man in the business of art who is also, in a sense, an artist of discernment. The show, which includes more than 400 works—portraits, sculptures, book maquettes, as well as prints and illustrated books—is at New York's Museum of Modern Art through September 6; then it will travel to the Art Gallery of Ontario, Toronto, the Krannert Art Museum at the University of Illinois at Champaign and will finish April 30 next year at the Toledo Museum of Art in Ohio.

He had no initial advantages. He came from nowhere, he was nobody, and he had no capital. His gallery looked fusty and half-derelict. Most of the time he seemed to be half-asleep, and he did nothing whatever in the way of promotion or public relations. (He had, indeed, a way of standing in the doorway of his gallery, with his arms stretched straight upward and his hands grasping the lintel. Passersby found this positively menacing. "He was like a gorilla fresh from the jungle," one of his clients once told me.)

And in a certain sense Vollard did come "fresh from the jungle." He was born on the little island of Réunion in the Indian Ocean. Réunion had produced more than its share of men of letters, and Vollard was proud of the fact that a great many aristocratic émigrés had chosen to go and live there at the time of the French Revolution. He himself, however, had a look of the Creole about him, and, although he would never say yes or no on that subject, people were free to draw their own conclusions from his dark skin, his soft rounded contours, his unhurrying movements and his general look of a tree bear that had broken into the pot of molasses.

He had one eye that glared out upon the world, and another that seemed hardly able to stay open. He adored women, and a great many women adored him. He was an exemplary guest and the most resourceful and attentive of hosts. To dine with Vollard in the cellar of his gallery was a pleasure much prized—chicken curry, Réunion style, was the dish of the day—and when he went out to lunch in the country he never failed to address himself in turn to every guest whom he regarded as well informed. "Tell me," he would say, "you who know everything, tell me. . . ." And even if the guest did not "know everything," he found himself telling Vollard what he did know that Vollard wanted to hear. It was by listening, above all, that Vollard prospered.

He came to France as a student in 1890, and after a short stay in law school in Montpellier he got to Paris at a time when—as he said in his memoirs—there were "masterpieces everywhere, and going, so to speak, for a song." He himself at that time did not really know one picture from another, but the world of painters and dealers and collectors interested him enormously. He looked, and he listened, and he bought first one little thing and then another, and he learned something about the business at first hand by acting as assistant to an established dealer.

Like many another great man of business, Vollard in his memoirs gives away nothing whatsoever that could be of use to any young person who aspires to do as well as he. But Ambroise Vollard let us know by implication what kind of man he was. At the time of his arrival in Paris, there were very few people who cared for what we now regard as the best art of the day. To see a Cézanne, for instance, you had to go to see an old color merchant who was known as *Le Père* Tanguy. Tanguy had plenty of Cézannes, and for a price that varied from 40 to 200 francs you could have as many as you wanted. Vollard learned all he could from him, but he had no intention of operating on the same

John Russell, New York Times *art critic, last wrote about David Smith for* SMITHSONIAN, *March 1977.*

Musee de Palais de Tokyo, Paris

Maurice Denis' *Homage to Cézanne,* 1900, is set in Vollard's shop. Left to right are Redon, Vuillard, Roussel, Vollard, Denis, Sérusier, Mellerio, Ranson, Bonnard and Mme Denis. Still life is by Cézanne.

basis. "A worthy fellow," he said of Tanguy in his memoirs, "but [he] did not grow rich by his trade."

Vollard was also impressed by another small-scale dealer of the time: *Le Père* Noisy. "The best picture-ferret in Paris," he called him, and he loved to talk about the flair, the perseverance and the speed of wit which characterized Noisy's business habits. Noisy knew everything about the art life of the previous 50 years, and one day when he was walking along a street in Paris he spotted an old woman who had under her arm a portfolio which dated from the days when Corot and Théodore Rousseau and others were making the name of the School of Barbizon. Noting her slow step and hesitant air, he inferred correctly that she had something to sell but did not know what to do with it. He offered his services, she was touched by his courtesy, he took her name and address, and by nightfall he had taken the train to her house in the country and brought off a deal on which he easily could have afforded to retire.

Vollard remembered such things, and when he in his turn got wind of a possible sale, there was nothing that he would not do to track it down. If he had the street but not the number, he would knock at every door until he found his man. If his man was out, Vollard would sit there like a statue until he came back. If his man didn't like dealers, Vollard would whip up a completely other persona in a matter of seconds. He never got tired, never lost patience, never seemed to be in a hurry. People who were deceived by his apparent passivity soon found out their mistake: Vollard when he wanted something was a terrier.

Another view of 6 rue Laffitte, drawn by Bonnard. Here is informality, chaos—and reverence for art.

He never wasted money on overhead. He began in a very small way, on a little street called the rue des Apennins on the lower foothills of Montmartre, and although he moved before long to the rue Laffitte, where all the big galleries were at that time, he never went in for anything in the way of installation. His windows were not always clean, there was no frock-coated employee to greet the visitor, his lighting was primitive, and if there was a chair in sight, it was likely to have two or three small pictures heaped on it. If paintings arrived in cases, the cases stayed around the gallery for weeks. If there were small sculptures, they were probably on the floor. He had been long enough in the picture business to have a low opinion of collectors in general—and to know, also, that the longer he could hold on to a first-rate painting the better it would be for him.

"First-rate" is the key word there. Like most of the rest of us, Vollard in later life spoke only of his successes. If he ever fell for an artist who came to nothing, he certainly was not going to say so in his memoirs. And the record is unique, after all: Vollard was the first man to show Cézanne in bulk, the first man to show van Gogh in bulk, the first man to show Matisse in bulk and the first man to show Picasso in bulk. Once again there is a key word: "bulk." The dealer is lucky today who can offer Cézannes and van Goghs in ones or twos, but Vollard's general practice was to buy up the entire output, when he could, and if possible to bind the artist to him with the kind of regular stipend which was less common then than now.

Though ideally suited to the period 1890-1905, when only a very few people coveted what was best in the new art, his imperious and secretive ways did not work nearly so well in later years. But there is literally no counting the masterpieces which passed through his hands at one time or another. A simple tally will give some idea of it. The last great Cézanne exhibition to be held in this country was at the Phillips Collection in Washington in 1971 and later that year in Chicago and Boston. Twenty-one of its 83 items had belonged to Vollard, and they included now classic paintings such as *The Card Players* from the Metropolitan Museum, the *Still Life with Apples* in the Museum of Modern Art, the Philadelphia Museum's *Mont Sainte Victoire,* the Phillips' own *Self Portrait* and *Seated Woman in Blue,* as well as that noble later watercolor, *The Bridge of Les Trois Sautets,* from the Cincinnati Art Museum. Since Vollard did not even meet Cézanne till the artist was in his middle fifties, we are entitled to infer that he put the acquaintance to very good use in his characteristic manner.

It soon got around Paris that when it came to great paintings of recent date, Vollard's gallery was the place

Vollard holds a Cézanne *Bathers* in hand, one of the many masterpieces always to be found in his shop.

Museum of Modern Art, New York. Larry Aldrich Fund

A lithograph by Bonnard, *House on a Court,* from a suite published and commissioned by Vollard.

Museum of Modern Art, New York. Abby Aldrich Rockefeller Fund

to go to. As has already been made clear, his was not the kind of gallery in which you virtually have to pass a means test to get inside the door. If young artists wanted to come in and prowl around, Vollard did not turn them away. He knew that the conversation of gifted young artists is a far better guide to the next moves in art than most of what appears in print. Some young artists even became clients of the gallery, as happened with Matisse in 1899. It was from Vollard that Matisse bought the little *Three Bathers* by Cézanne which he kept by him for nearly 40 years. And when the next generation came along, Vollard was ready for it.

There is in existence as proof of this a drawing by Pierre Bonnard (above) which shows us exactly how Vollard's gallery looked when it was at NO. 6 rue Laffitte. Vollard didn't like to do things by halves, and

Paul Signac made this lithograph, *The Port of St. Tropez,* 1897-1898, for the Galerie Vollard.

just as his Cézanne exhibition in 1895 had been chosen from a stock of at least 150 paintings, so did the inaugural show at no. 6 rue Laffitte in 1897 display a most formidable hand. More than 60 paintings by van Gogh were on view, together with as many drawings as Vollard could find room for. Events of this kind get into history books, but the enduring life of the gallery came rather from kitchen parliaments of the kind which Bonnard recorded. They took place in a scene of total confusion. Paintings by the score lay on the floor, against the walls, on chairs, on tables and on desks. Only a cat, and a fine-boned one at that, could have threaded its way through the room. In the foreground stands Vollard himself, with one eye almost closed and the other most ferociously alert. He holds in his hand a small *Bathers* by Cézanne. Early sculptures by Picasso—cast at Vollard's instance—add a further hazard to the scene. As for the three senior visitors, whom we at once identify as Degas, Renoir and Pissarro, they sit like men entombed by an earthquake. Quite clearly they will never get out. Bonnard alone—near, spry, the inspired observer and eventual recorder of all around him—seems perfectly at ease as he comes in from the world outside.

That was the sort of gathering which kept Vollard's imagination alive. He bought from the artists in question as often as he could, but he also prized them as much for their counsel as for their company. Art historians look down on Vollard's memoirs, because they think them long on gossip, short on reliable facts and quite useless with respect to the problems of style and dating which are fundamental to art history. But Vollard was not writing art history: he was making it. He made it by his choice of artists, and he also made it as a publisher of prints, illustrated books, sculptures and ceramics. If Picasso the sculptor is esteemed almost as highly as Picasso the painter, Vollard can claim some of the credit, in that he brought Picasso's first sculptures to the notice of his visitors.

There is not a great museum in the world that does not have in its print room some of the prints which Vollard published from 1895 onwards. There is not a bibliophile in the modern field who would not eagerly reach out his hand for the edition of Verlaine's poems

Another of the fine works of graphic art commissioned by Vollard: Edouard Vuillard's *Children's Games,* part of the suite *L'Album d'estampes originales de la Galerie Vollard,* which was published in 1897.

Museum of Modern Art, New York

which Bonnard illustrated for Vollard under the title of *Parallelement*.

He knew just what he was doing at any given time, and he also knew just what his artists needed to do. Long before 1900 he got Bonnard to make the series of prints which was called, with an almost English understatement, *One or Two Aspects of Parisian Life* (p. 71). Those prints are the epitome of Bonnard's genius, just as Vuillard never did anything better as a printmaker than the series which he made for Vollard as a young man.

A publisher who could wait

Vollard as a publisher had a long patience. He didn't mind waiting for the right paper, and he didn't mind waiting for the right typeface, and he positively enjoyed waiting for the art. He was never in a hurry. He might not even have begrudged the fact that some of his most ambitious projects—Picasso's illustrations for Buffon's *Natural History* (right, below), for one, and Rouault's for *Les Fleurs du mal* (right) for another— did not appear until after his death. To anyone who was around just after World War II, those publications looked like the best form of immortality.

His achievement as a publisher will never be on everyone's lips. The books are rare and cost a great deal of money. Individual prints now cost as much as a painting by the same artist would have cost 30 years ago. Even if we see the books in an exhibition, we can only see them one page at a time. But he set the standard by which all other publications of the kind are judged. Looking at a new illustrated book, we say, "Well, it's all right, but just put it beside Segonzac's edition of Virgil's *Les Géorgiques.*" Picasso's etchings for Balzac's *Le Chef d'oeuvre inconnu* are among the most successful of all his undertakings.

So an exhibition like the one which the Museum of Modern Art in New York is giving to Ambroise Vollard is well worthwhile. Vollard the publisher necessarily is more to the fore than Vollard the dealer, if for no other reason than that the show, made possible by grants from Exxon Corporation and the National Endowment for the Arts, is the responsibility of the Department of Prints and Drawings.

Vollard died unexpectedly (in a car accident) in 1939. World War II broke out very soon afterward. Given the convolutions of his private life, the condition of France during the German occupation, and the traditional reluctance of the French to let anyone pry into their finances, it is very doubtful that we shall ever know exactly what passed through Vollard's hands during his long lifetime. But this we know for certain: that he was one of a kind, for all the attempts that have been made to emulate him.

Museum of Modern Art, New York. Gift of Mlle Isabelle Rouault

To illustrate Baudelaire's *Les Fleurs du mal,* Vollard commissioned Rouault. Here, his *Bride and Groom.*

Museum of Modern Art, New York. Gift of Mrs. John D. Rockefeller jr.

And Picasso, to accompany Buffon's *Histoire Naturelle,* with 31 masterful aquatints.

As a subject he was rich in possibilities, as in Renoir's *Ambroise Vollard Dressed as a Toreador.*

A coruscating example of simultaneous portraiture, the master Picasso's view of the master dealer, 1938.

Lent by Mrs. Graham H. R. Jenkins

Named for the tug that hugs it alongside, barge-ferry *Carole Ann,* summoned by signal from either bank of the Ohio, carries half a dozen cars between St. Marys, West Virginia, and Newport, Ohio.

To get from here to there a pleasant way, take a ferry

Much slower than a speeding plane or car
—but a tremendous energy saver—it is
a downright beloved mode of transportation

In ferryboat annals, or anywhere else, there is no record of how Charon's passengers enjoyed their ferry trip across the River Styx to Hades. None ever came back to tell of it, for in mythology they were all dead souls. So far as they were concerned it was a one-way free ride, though Charon the ferryman didn't row them across just for love of his work; he got to keep whatever coins their relatives had put in their mouths.

Among the living, never mind the deceased, there has always been, and especially for the young, a degree of fascination with ferries. To take any ferry is to embark on a little adventure, to take a fling, and even today some of the best flings in life are free. The little Hatton ferry near Scottsville, Virginia, comes to mind. It is hauled across the James River by cable (a great energy saving), it can take two cars at a time and it costs nothing. A whole flock of bigger, state-operated ferries in the South also are free; you can ride them gratis all day long if you have the time. The little *Carole Ann* on the Ohio River (left), is not quite free, but is worth every penny of the fare (40 cents one way).

All ferryboat-riders have their favored ferries. A few are shown on these pages, but only a few can be, because there are nobody-knows-how-many ferryboats plying our rivers, harbors, bays and sounds. Hundreds, perhaps thousands. Some are necessary pleasures, to be ridden five days (ten times) a week going to work and back; none of them is just a necessary evil.

For many people (20 million fares a year), New York's Staten Island ferry has always been the world's

Photographs by Charles E. Rotkin

In New York harbor, ferry to Statue of Liberty on Liberty Island carries 1.5 million people a year.

Below: On the Mississippi, *West Side* (left) and *Voyageur* ply between New Orleans and the west bank.

greatest, partly because it used to be the city's greatest bargain at a nickel a ride (now a quarter, and still a bargain). Its slips near Battery Park, at the bottom of Manhattan Island (p. 81), are hard by the dock where tourists congregate to take the Liberty Island (formerly Bedloe's Island) boat (above) and are next door to the Governors Island ferry, which is free but unavailable unless you are an "authorized person." (The island—not used for almost 200 years as the home of New York governors—is a Coast Guard base.)

The bridge and the tunnel are what endanger the ferry as a species of transportation. The San Francisco Bay Bridge made obsolete the 40 to 50 ferries that used to cross between the big city and Oakland, and the Golden Gate Bridge knocked out the ferries to Marin County on the north. (Some still work on Puget Sound, 900 miles to the north, under such Indian names as Nisqually and Klickitat, and the Washington state ferry system still takes in 15 million fares a year.) The Baltimore tunnel put still others out of business; in Seattle two floating concrete bridges exterminated the fleet of ferries that used to "bridge" Lake Washington.

It is not always all that easy to stamp out ferries. The Golden Gate bridge, carrying 90,000 cars a day, is so congested—and the cost of double-decking it so horrendous—that a new ferry system has sprung up to carry commuters, at wonderful savings in time and gasoline, between San Francisco and points north. In Louisiana the massive Greater New Orleans cantilever

Above: On Fire Island, pandemonium attends arrival of ferry with loads for coaster wagons.

On Lake Michigan, a ferry to Ludington heads out of Milwaukee under a not-yet-opened bridge.

bridge becomes in rush hours a choked-up, fender-bending nightmare. Smart commuters take a ferry instead. A $20.4 million federal grant to the Mississippi River Bridge Authority will be used not to build more bridgework but to buy ferries and fix up terminals. As on any route there can be dangers: last October 20 a tanker overran the ferry *George Prince* about 20 miles upriver from New Orleans; 78 commuters died.

Fortunately, there are some bodies of water so wide they can never be bridged, and on these the ferry is safe and thriving. Northumberland Strait, between New Brunswick and Prince Edward Island, Canada's smallest province, is one. It takes the huge motor vessels *John Hamilton Gray* and *Abegweit,* both ice-breaking steamers, 55 minutes to cross the strait with tourists (up to 160 automobiles) and other necessities.

The most glamorous ferries of a few years ago plied another unbridgeable place, the Strait of Georgia between the British Columbia mainland and Vancouver Island. For $10 a car you could ride 24 island-strewn miles between Tsawwassen, south of the city of Vancouver, and Swartz Bay, 19 miles from Victoria, in style, on a fantastic ferry such as the *Queen of Alberni.* No more; today it's cafeteria-style and less leisurely.

On one British Columbia route the old, elegant atmosphere is still there, if you don't mind paying for it. It goes from Kelsey Bay on Vancouver Island 330 miles up to Prince Rupert, threading the Inside Passage toward Alaska. Dining room, staterooms, lap of

With commuting passengers from Sausalito across the bay, the *Golden Gate* docks in San Francisco.

luxury all the way, and for 20 hours of travel only $60 for a car and $45 and up for an adult.

The continent's most scenic ferry trip may be the 75-hour run up the Inside Passage from Puget Sound to Skagway, Alaska. Not out of sight of land for 1,166 miles, the ferry *Columbia* carries tourists (1,000 and 184 cars at a time) along with salmon-cannery workers, fishermen and Indians traveling between villages.

Fire Island ferries in New York state are something else, a mosquito fleet that skitters across Great South Bay with people, pets and impedimenta, but no cars. Automobiles are forbidden on most of Fire Island, so residents park coaster wagons at the island docks to cart their groceries and suitcases home. For a 20-minute trip from Patchogue to Davis Park the fare is a ripoff—$2 for a grownup, $1 for a child—but the ferry is the only way to get to most parts of Fire Island.

Passengers are incidental—as they are with too many railroads—on the Lake Michigan ferries between Milwaukee, Wisconsin, and Ludington, Michigan. The need for them has been the need of the Chessie System railroads to get freight trains across the lake. But passengers are tolerated ($8.50 and up per person, $15 per car, one-way). And for a four-hour trip the fare, especially compared to Fire Island, is cheap.

A historic, if unglamorous, ferry crosses the Potomac River 35 miles upstream from Washington, D.C., and when all goes well, takes no more than five minutes to do it. The excuse for the ferry is that there is no river bridge near Leesburg, Virginia, or Poolesville, Maryland, so the traffic bears a toll of $1.25 for a car, 25¢ for a pedestrian. It is called White's Ferry because 100 years ago a man named White owned it. The present owner, Malcolm Brown, thinks that ferry service there goes back at least to the Revolutionary War, although it is a Confederate general in the Civil War, Jubal Early, whose name is on the six-car ferry.

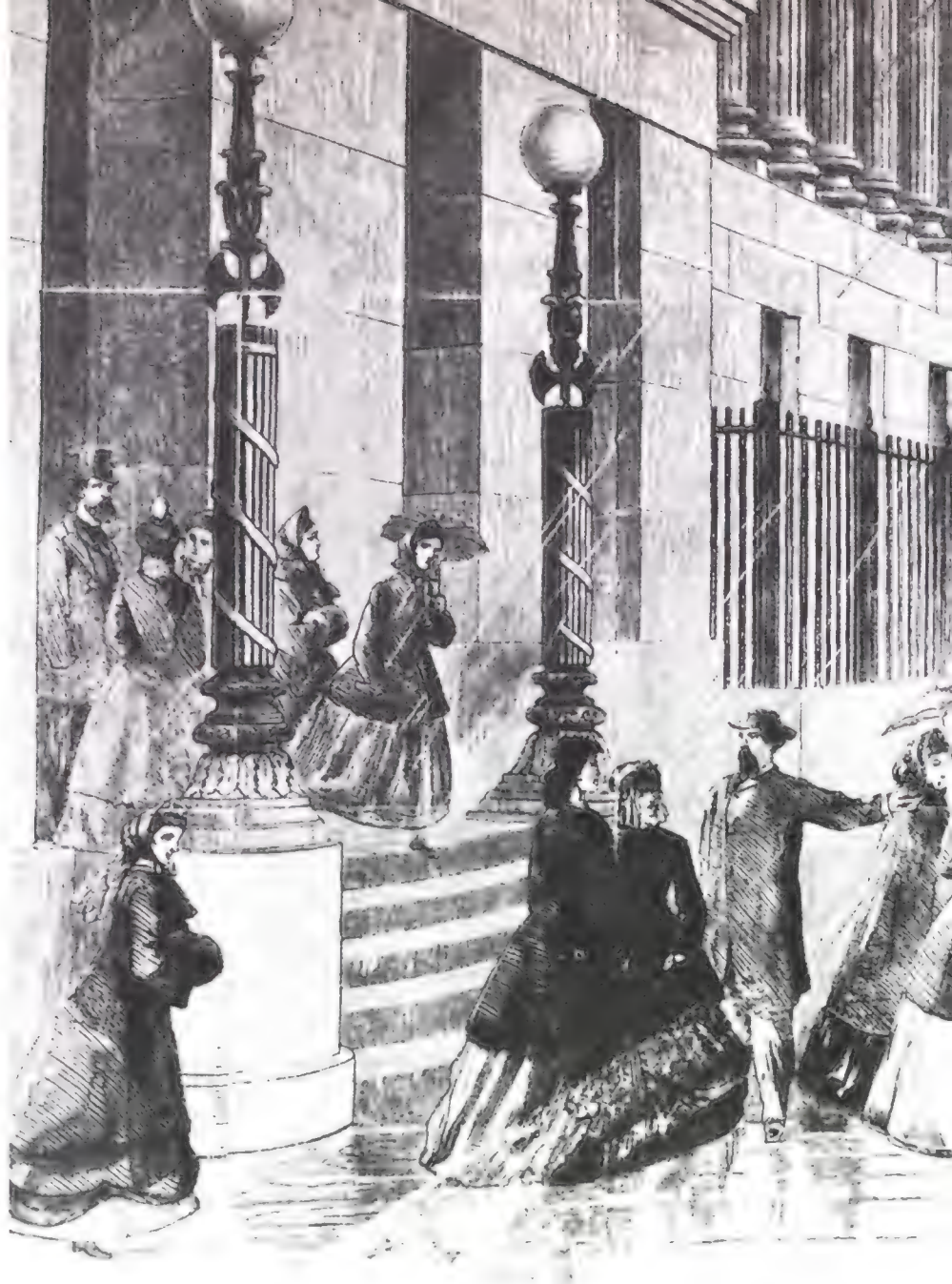
Someday there probably *will* be a bridge—Leesburg and Poolesville will see to that—and then White's Ferry will be just a place-name. But ferries have a way of leaving their mark on the land even after they have been taken out of service and broken up for scrap. Dobbs Ferry, for one, on the Hudson. Vantage Ferry, on the Columbia. Harpers Ferry, of which there are at least two: one on the Mississippi in northeast Iowa, and (the one of *John Brown's Body* fame) at the confluence of the Shenandoah and the Potomac in West Virginia. There has been no ferry there for 158 years (there was one from 1747 to 1819), but there will always be a Harpers, no apostrophe, Ferry.

Slips for Governors Island (far right) and Staten Island ferries are at tip of Manhattan.

By Ross K. Baker

Entry of women into federal job world—at a price

In 19th-century Washington, government doors open up but the long putdown begins with poor pay, menial jobs and hostility from men



Hundreds of women workers poured from Treasury Department onto rainswept, gaslighted street in

It was called, innocently enough, the "wetting room" and was tucked under the eaves of the Treasury Building. The roof sloped down sharply so that those standing at the long troughs wetting down the paper could not work in an upright position. During the summer months, when the sun beat down unremittingly on the roof, the combination of the heat and the vapors rising from the troughs caused many workers to collapse from heat prostration.

Elsewhere in the building was the Division of Issues. After the sheets of paper had been wetted and printed and the currency cut into individual bills, 40 people counted out the newly printed dollars. With the workday running from 9 A.M. to 3 P.M. with a half-hour for lunch, as many as 50,000 bills passed through the hands of a single counter—9,090 notes an hour, 150 each minute, and two and a half each second.

Across town, 15 blocks away, stood the Government Printing Office (GPO). The third floor of the building was given over to the binding of government reports. The standard binding was morocco leather with the title stamped in gold leaf. The gold leaf came in tissue-thin sheets to be applied to the bindings with stamps heated by gas. The only source of ventilation would have been the windows, but they could not be opened lest the fragile foil be blown away by the wind. So the windows remained closed and the workers performed their monotonous chores with no relief from the heat and fumes.

The volumes then went to the "stitching room" where a worker sewed the books by hand at a piecework rate of 30 cents each. On a good day, one could stitch nine volumes.

The work was punishing both at the GPO and the Treasury. It was performed by women. The pay was marginal. The year was 1883, Chester A. Arthur was President, and the employment of women by the federal government had come of age. The Civil Service Act had become law on January 16 of that year, and for the first time women were encouraged to compete directly with men for jobs in the federal government. The Pendleton Act, as the Civil Service Act was popularly known, represented for women more of a point of departure than a destination. Despite the great victory that the Act represented in beginning to vanquish the spoils system, real equality was still a long way off.

Women never were totally excluded from government work. From time to time a woman would secure appointment as a postmaster in some country town. But in terms of the federal work force in Washington, the Republic was almost 75 years old before women made their presence felt in the capital. When Harriet

1865 at the end of a grueling day of tedious labor—often in airless, crowded, dingy and ill-lighted rooms.

Martineau came here from England in 1832, she found that only seven occupations were open to American women. Government service was not among the seven, which tended to run a narrow gamut from the so-called "needle trades" to factory workers and primary schoolteachers.

To say that women broke into government as the result of a protest movement is not really accurate. The Women's Rights Convention at Seneca Falls, New York, in 1848, issued a broad indictment of the political, social and economic thralldom of women and demanded equal rights, but specific employment goals were not laid down. There were no marching orders to besiege the bastion of male dominance that was the federal service, but it undoubtedly emboldened some women to storm the ramparts on their own—occasionally with great success.

One of the first to arrive was Clara Barton (p. 88), a former schoolteacher with strong, clear penmanship, who secured a job as a clerk-copyist, then the next best thing to a Xerox machine, at the Patent Office in 1854. Soon, the industrious future founder of the American Red Cross became a confidential clerk to the Superintendent of Patents at an annual and heady salary of $1,400. She was certainly one of the first women (she believed herself to be the very first) appointed to a regular position in a federal agency with the salary and status of a man.

The work, wading through huge volumes of technical data and copying it by hand into thick ledgers for future reference and preservation, was painstaking and arduous. At the outset, she was paid for piecework—ten cents per 100 words—and frequently she worked at home until midnight.

She once described her career at the Patent Office, where she and other women were the objects of intense discrimination, as "a weary pilgrimage which it was necessary for me to accomplish. . . . It has been a sturdy battle, hard-fought, and I trust well won." In 1861, she left the Patent Office for the battlegrounds in Virginia.

It was the Civil War that accelerated the trend toward female employment, initiated by the process of industrialization. In 1861 Washington was more than simply the capital of an embattled government. It was also the base of operations for federal forces engaged in Virginia and Maryland. As units from all over the country converged on Washington, they were soon joined by huge numbers of women who were drawn to the capital by a variety of impulses: "Women seeking their husbands; women, whose husbands were dead, left penniless with dependent children. Young girls, orphaned and homeless, with women adventurers of every phase and sort, all, sooner or later, found their way to Washington." This was the description of wartime Washington provided by Mary Clemmer Ames in her *Ten Years in Washington,* and it evokes the feeling of desperation and frenzy that afflicted those women who had been displaced by war.

The government had absolutely no plans for the employment of these women, nor did it have any cause to deny them employment. Like so many other monumental social changes, the massive employment of women by the federal government was circumstantial and unplanned, rather than the subject of detailed and exhaustive preparation. The most forceful argument was the simple fact that since so many men had been lost to the civilian labor force, it was a matter of expediency to hire women.

If any male official deserves credit for a reasoned and calculated approach to female employment, it was the man appointed by President Lincoln as Treasurer of the United States, General Francis Elias Spinner.

The author, a professor of Political Science at Rutgers, once served as an aide to Senator Mondale.

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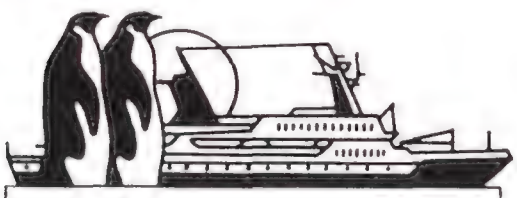

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In 1862, Spinner confronted Salmon P. Chase, then Secretary of the Treasury and later Chief Justice of the United States, with the irrefutable argument that "A woman can use scissors better than a man, and she will do it cheaper. I want to employ women to cut the Treasury notes." Chase agreed to Spinner's plan, and almost overnight the General was besieged by scores of women who desperately needed work. With commendable fairness Spinner, himself the father of three girls, distributed the jobs with impartiality and all deliberate speed. He found money in the Treasury budget to hire the women at $600 per year as "temporary clerks." In 1864 Congress appropriated money specifically for the salaries of these women. Spinner's action, however, had the effect of luring even more women to Washington to vie for the newly created posts.

Not every department head was as evenhanded as General Spinner in meting out jobs to women. Political favoritism rather than competence or even need became the touchstone of female employment by the federal government. As soon as the Treasury posts and those in other agencies became the subject of Congressional appropriations, Senators and Representatives began to insist that job applicants get their clearance and approval before a woman could be considered for a post. Despite the inhibitions of the prevailing Victorian modes of the time, some observers hinted broadly that sexual favors were often demanded of women by members of Congress as the consideration for a government job.

As demeaning as this mandatory patronage system was, it represented at least a recognition of the appropriateness of female employment but there was still

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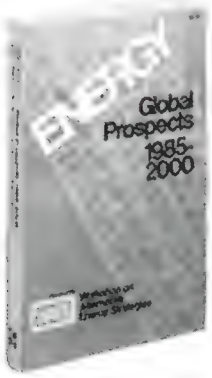

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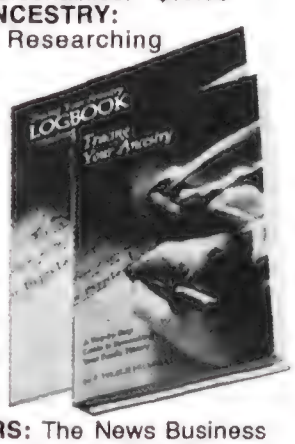

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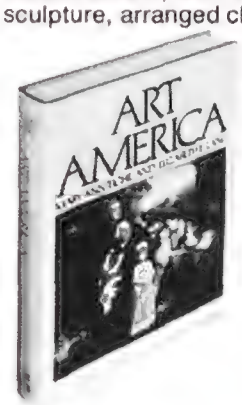

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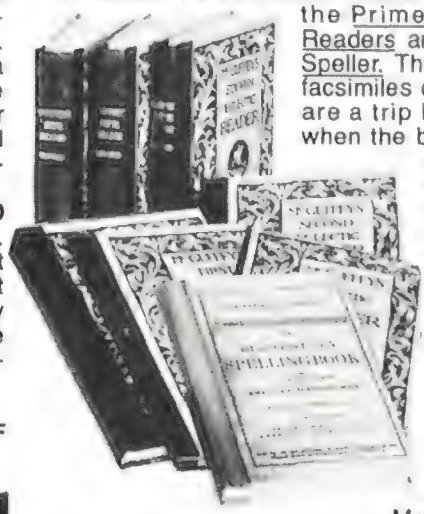

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a wide discrepancy in salary. Congress' 1864 appropriation had set a maximum salary of $600 a year for female clerks, while male clerks earned from $1,200 to $1,800 per year. General Spinner attempted to redress this form of discrimination by adhering, as much as possible, to equal pay for equal work.

Some improvement—but no teapots

The close of war brought some betterment in the conditions of female employment in Washington. In 1870 Congress passed a law permitting department heads to pay women on an equal basis with men for identical work, but the provisions were purely discretionary. This grant of discretion had the effect of creating a kind of hierarchy of female employment. Liberal and well-intentioned department chiefs tried to establish genuine parity. The less enlightened ones actually succeeded in reversing the trend of gradual reform which the war had brought. Hugh McCullock, who served as Andrew Johnson's Secretary of the Treasury, presided over an expansion of employment opportunities for women in his department, but determined that their presence should be as unobtrusive as possible. According to Mrs. Ames, the female employees at the Treasury had taken to brewing tea at their desks and storing the pots and strainers on the windowsills. McCullock burst into a fury and ordered the women to conceal their utensils—this at the time when the spittoon was accepted as a prominent office fixture in and out of government.

Men took out their resentment against women with a number of other unpleasantries. Clara Barton reported that men lined up in the halls, stared, blew smoke in their faces, spat tobacco juice, and made catcalls and obnoxious remarks.

"I walked rapidly, seeing only their boots," she said of running the gauntlet.

The practice of permitting department heads maximum discretion in the terms of employment of their female personnel produced some unusual results. Women working at the Treasury or the GPO tended to find themselves in menial or basic clerical positions. These women, typically, came from working-class families or else they were the wives of enlisted men killed in the war who had thrown themselves on the mercy of a Congressman for a job. In the War Department

and in the Office of the Quartermaster-General (QMG), in particular, the social complexion of the female work force was quite different. Jobs in that agency were set aside for the widows, daughters and sisters of high-ranking officers killed or injured in the line of duty. They were, to use the decorous term of the day, "gentlewomen." While their sisters at

Apron-clad worker ran stamp-perforating machine at the Bureau of Engraving.

Treasury, right around the corner, worked largely as a vast and undifferentiated labor force, the women at QMG had private offices and were generally employed in entering and copying correspondence. Many of these cultivated and educated women "moonlighted" as correspondents for journals, writing poetry, and doing a variety of other tasks to bring their income up to the level of their better-paid colleagues. But even within the Treasury Department, where the use of women was most widespread, the social composition varied from bureau to bureau.

At the very lowest level there was the "broom brigade," the ungraded and unclassified janitorial staff composed of the widows of private soldiers and of black women. In the latter group were a num-

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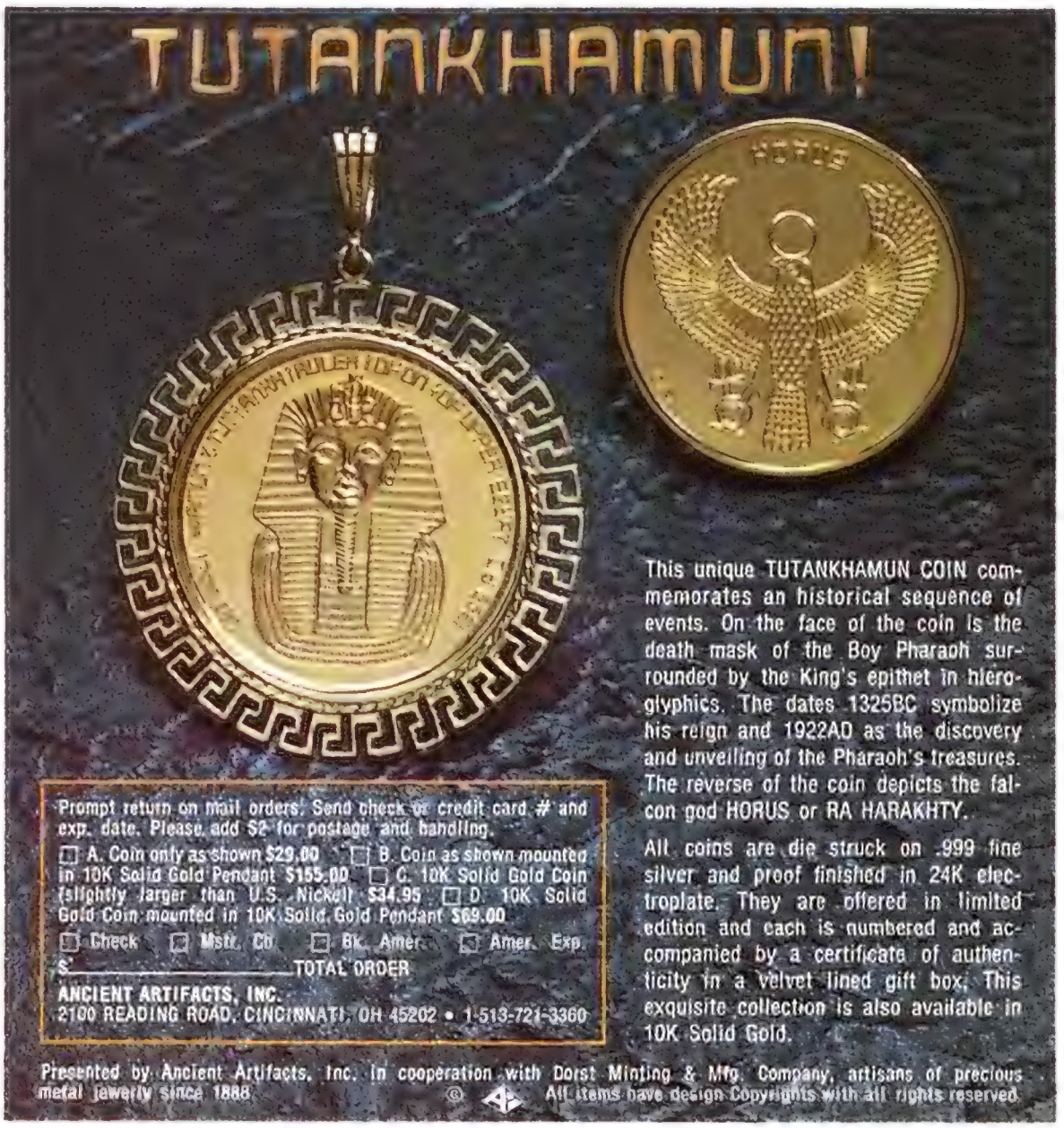

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ber of young women who were working their way through Howard University on a monthly pay of $15. By 1880 there were 90 women in Treasury's custodial force. But among the almost 1,000 women employed by Treasury in 1880, there was, unquestionably, an elite group. Among the select were the daughters of Chief Justice Roger B. Taney, who had died in 1864, and Robert J. Walker, who was James K. Polk's Secretary of the Treasury, the widows of governors, of war heroes, as well as many a future wife of other prominent political officials.

It was estimated that in 1880 about 50 of these well-born women worked in the "beautiful apartments," as one observer described offices of the Internal Revenue Service, doing everything from copperplate engraving to answering letters.

Despite the almost-universal practice of keeping women in low-level positions, some women, by dint of their ingenuity or unusual skills, were able to transcend the limitations placed on them. A female mathematician at the Treasury Department was a person of such surpassing genius that she was given the responsibility for preparing virtually all of the department's statistical reports to Congress. Members of Congress themselves, baffled by the then modest inundation of tables and charts, often called upon her to explain and interpret figures for them. Her office mate was a man charged with the same responsibilities but incapable of discharging them because he was usually drunk. When his drinking finally incapacitated him and he was taken off to the Government Hospital for the Insane (renamed St. Elizabeth's Hospital in 1921), the supervisor of the division assigned all of his work to his female colleague—but provided no increase in salary for her.

Clara Barton believed she was first to get salary and status equal to a man.

Mary F. Hoyt, top test scorer, became the first woman Civil Service appointee.

Some women did receive the credit and renown that had been denied the gifted female mathematician. For within the narrow occupational path to which they were confined, their talents were indisputable and indispensable and could not be hidden from public view. Working in the Redemption Division of the Treasury Department during three decades was Mrs. Stephen Brown, the greatest expert in identifying burned, mutilated and unrecognizable currency which had been submitted to her agency for redemption. Once, Mrs. Brown was presented with a hardened brown lump sent to the Treasury Department by an Iowa farmer, who claimed that the substance represented six five-dollar bills that had been eaten by his goat. After slaughtering the offender, the farmer had extracted the contents of its stomach and sent them to Washington, where they were turned over to Mrs. Brown. In two hours she had separated the particles of currency and ascertained that the goat had indeed swallowed the money, and authorized the sending of six brand-new five-dollar bills to the farmer.

Another female expert saved $185,000 which had lain in a paymaster's trunk at the bottom of the Mississippi River for three years after the steamer *Robert*

Carter was sunk. The currency was soaked, rotten and obliterated, but not only did she determine the denominations but the serial numbers as well. The express company responsible for the original shipment gave the Treasury employee $500 in recognition of her services. Still another female member of the team was able to identify and redeem a million dollars in currency reduced to ashes by the great Chicago fire of 1871.

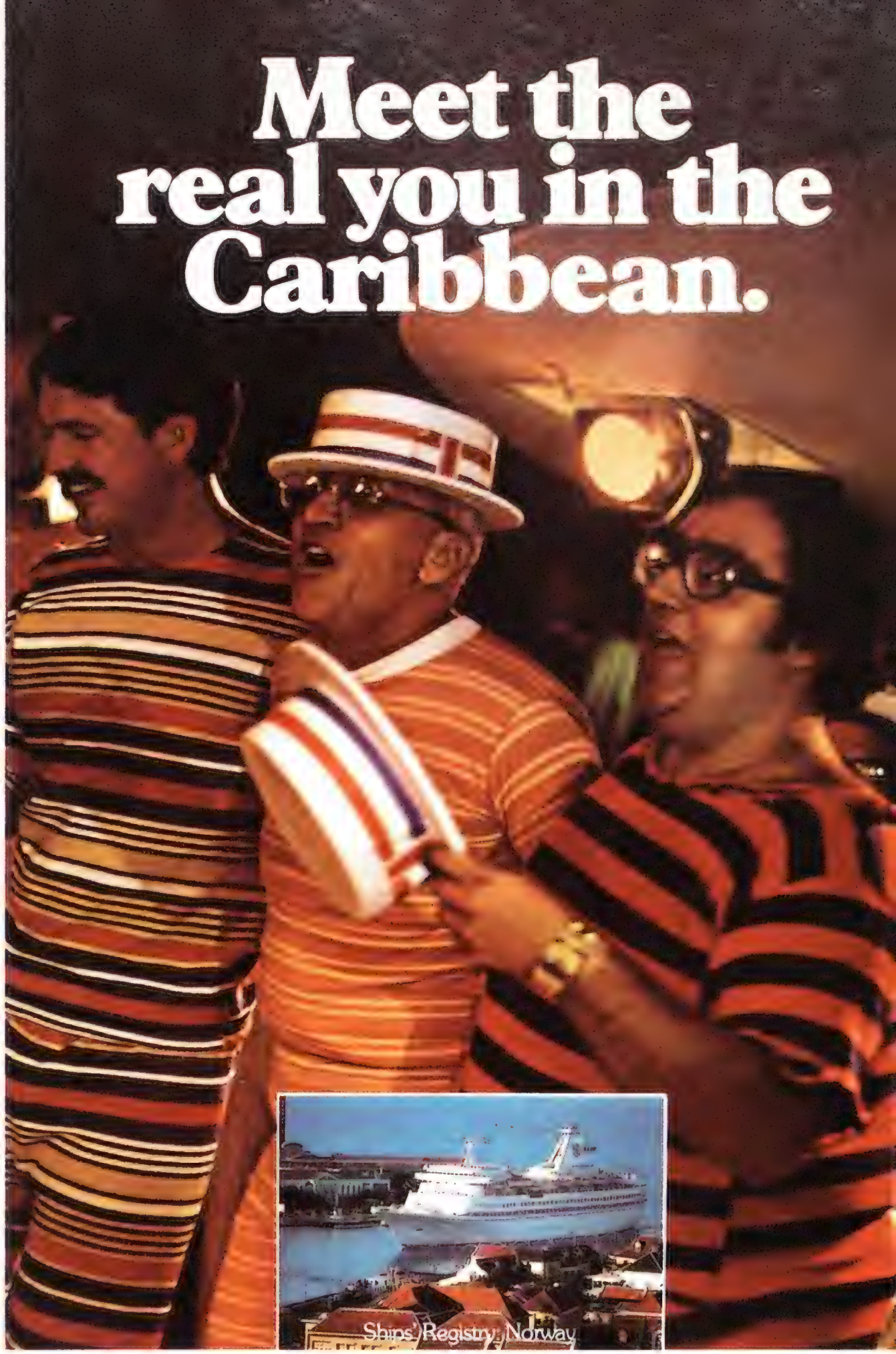
The detection of counterfeit money also fell within the purview of the Treasury Department's female sleuths. General Spinner would not trust the job to men because he believed that women had a superior ability to detect bogus currency.

But if skill was a salient quality of Spinner's female lieutenants, rectitude was another. The case of Sophia Holmes illustrates the fact that the Treasurer's faith was not misplaced. Mrs. Holmes was the widow of a black soldier and former slave killed in the Battle of Bull Run.

Money in the wastebasket

She was given a job as a charwoman by Spinner and worked in the Division of Issues to support her two small children on a salary of $15 a month. One afternoon while cleaning an office she found $200,000 in greenbacks in a hamper of waste paper. All the employees had left for the day except for the watchman and the legendary Spinner himself, who slept in his office at the Treasury every night in order to ensure the absolute safety of the people's money. Mrs. Holmes feared that if she reported the find to the watchman he would take the money and blame the theft on her. So all night long she hovered over the hamper waiting for Spinner to make his rounds, at which time she reported the cache to him directly. "The watchdog of the Treasury," as Spinner was nicknamed, reprimanded the careless officials and conferred on Mrs. Holmes the title of "janitress" at an annual salary of $660. She thus became the first black woman ever to receive an official appointment to the service of the U.S. government. Although Mrs. Holmes had demonstrated her integrity to an astounding degree, her salary was considerably less than that given to a man entering the Treasury at the lowest ungraded rank.

By 1883, the clamor for reform of the patronage-ridden federal service had be-



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come so intense that Congress passed and President Arthur signed the Civil Service Act, which made a limited number of government posts in Washington subject to competitive examinations.

When the test was first administered that year, the highest score was achieved by Mary Francis Hoyt, a Vassar College alumna whose appointment to a $900-a-year clerkship took effect on September 5. Still, the old 1870 measure which gave discretion to agency heads continued in force. This meant that although women could compete for federal jobs on a basis of equality with men, they had no assurance they would be considered for the jobs, let alone be given equal pay.

In a particularly insidious way, technology, too, worked to restrain women's progress. In 1868, an eccentric printer named Christopher Latham Sholes secured a patent on a typewriter. It was another six years before a practical commercial design went on the market, and even more years before the government made large-scale use of these machines. Just at the time when the remarkable Mary Hoyt was knocking the top off the civil service exam, the typewriter was coming into common use in the offices of the federal government. According to the 75th-anniversary history of the U.S. Civil Service, *Biography of an Ideal,* "women quickly caught on that they were well suited for typing. Typing and shorthand schools sprang up almost overnight. . . . By 1894 women were receiving about 14 percent of government appointments to typists' positions, and this percentage rose to 25 by 1914." (Today, according to the latest statistics on the number of clerk-

Sophia Holmes, $15-a-month charwoman found cache of $200,000 in wastebaske

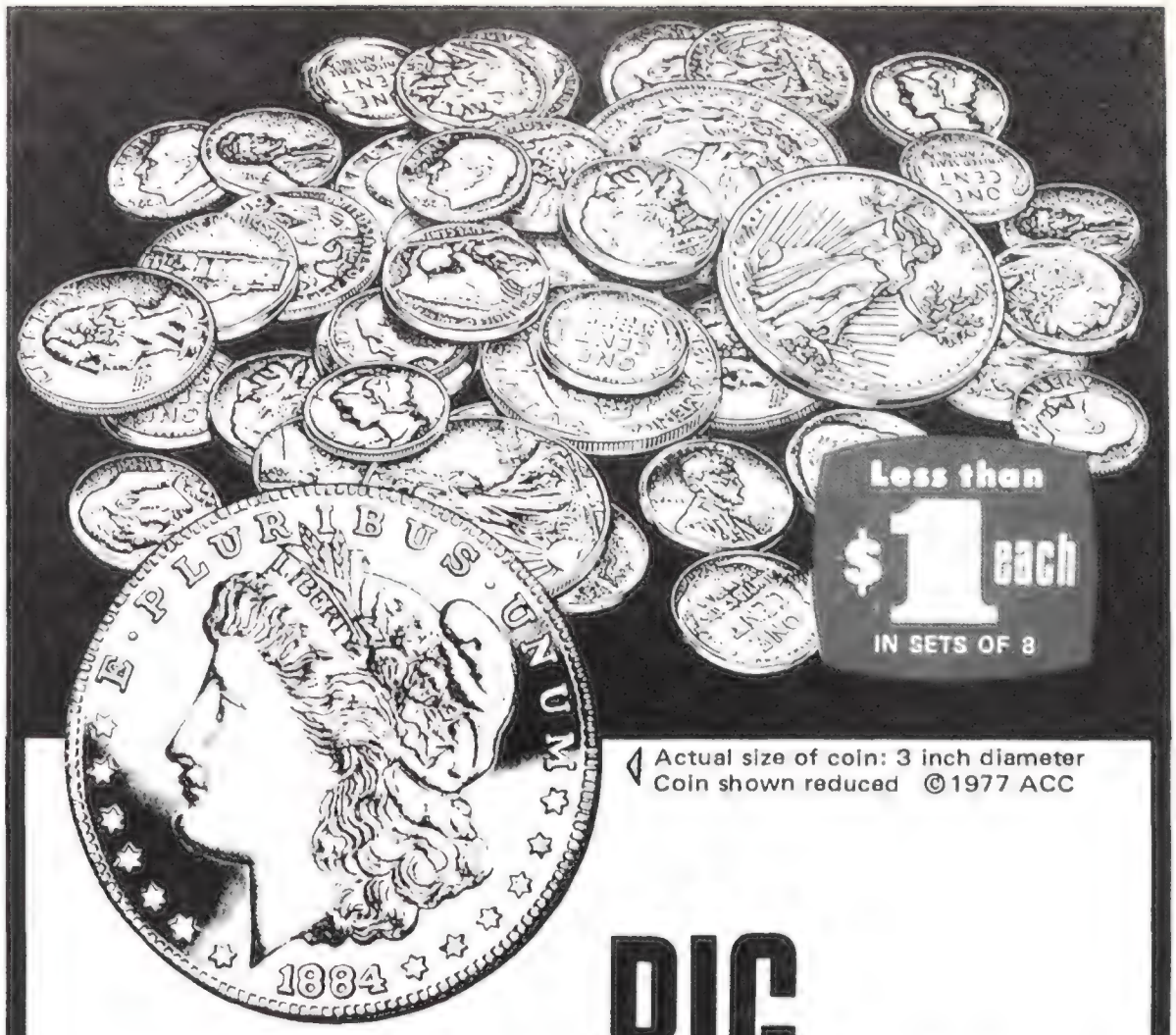
typists working in government jobs, women outnumber men by a vast majority—73,250 to 3,415.)

There is a historical interpretation which holds that the invention of the cotton gin gave slavery a new lease on life when it was on the verge of dying out in the late 18th century. It would be wholly appropriate for American women to look upon the typewriter the same way that American blacks regard the cotton gin—a device which covered exploitation with the fig leaf of increased productivity. With the popularization of Alexander Graham Bell's telephone, which he demonstrated at the 1876 Centennial Exposition, the occupational fate of women in government seemed sealed. While those not in the labor force continued to be restricted to the traditional realms of "children, cooking and church," the female civil servant usually was limited to keyboard and switchboard.

The surge in female employment at the time of World War I was followed in peacetime by bureaucratic retrenchment, which obliterated virtually all the gains that had been made by women. Again, as in the case of their short-lived advances during the Civil War, a temporary labor shortage had opened doors that were quickly closed when Johnny came marching home again.

The problem of sex discrimination in federal employment is not, of course, a quaint 19th-century quibble. Even to the present, nearly three-quarters of the women in government posts have clerical and technical jobs that pay less than $10,000. Women may have come a long way, but they've got a long way yet to go.

and stood guard until U.S. Treasurer on
his regular nightly rounds took over.



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Around the Mall and beyond

At the beginning of the year, there was a mention in this column of some Atlas lion cubs due to be born early in 1977. To bring everyone up to date on the happy news, the youngsters, whose folks are from Morocco and extinct in the wild, have arrived and are thriving at the National Zoo.

One of the six new cubs was raised by zoo keeper Art Cooper. It's a male named Amaziga and it went around with Art back and forth to work until it got so big that its affectionate pounces and pats and gnaws were almost enough to take a man's head off. The other cubs were raised by their moms, Basra and Ouiouane, and are having a ball.

I was reminded, recently, of a zoo interview about vultures that I tried to hold with a bird expert two years ago (Around the Mall, August 1975). I found then that conversation was almost impossible because of the screams and squawks of parakeets and macaws and parrots outside the office in the basement of the then new birdhouse. I went back to the now-opened and well-used birdhouse as the guest of a luncheon group that meets at the Smithsonian at intervals. This time, we ate right beside the splendid rooms where tropical birds are kept in controlled humidity and temperature, and I rediscovered my noisy friends.

Many of the same birds that yelled at me down in the basement have been promoted upstairs. Instead of the servants' quarters, they now have their various parlors to inhabit. They parade about in their finery, or sit quietly on a tree trunk reading *The Times* and waiting for Hudson to serve tea. And they gossip endlessly, as before, but now in more cultured accents. My group was pretty cultured, too, and while we gabbled away over cold roast beef at our tables out on the concourse, the macaws and toucans and other species honked and shrieked and tweeted over raw peanuts and cereal grains and kale.

I was nervous when Secretary Ripley rose to speak. I knew from experience the birds could outshout him at the drop of a feather, and I wanted to hear what he had to say about the artificial insemination of Japanese cranes in Wisconsin.

But Mr. Ripley knows his birds. He told how these cranes would have mated all right in direct confrontation, but that in captivity the male could have celebrated the consummation by stabbing the female to death with his bill. So the bird handlers prepare both cranes for their indirect liaison—a task accomplished with gentle and expert manipulation—and

Art Cooper's hands hold his cub . . .

. . . and Mom plays with one of hers.

then at precisely the right moment. . . .

As the talk progressed, there was not a cough nor a foot-scraping among the humans, and, strangely, not a peep out of the birds. I glanced over at a neighboring toucan. Head on one side, he was obviously enthralled by every word.

If you should be driving along a highway and run into a toucan—or a great auk, a passenger pigeon or an ivory-billed woodpecker—you might be forgiven if you had the impulse to stuff it. But how do you skin a bird? Most people get through life without having to face that problem, which makes both them and the birds all the happier, but if it is really essential for you to skin a bird, you can learn how at the recently opened Naturalist Center at the Museum of Natural History. You can learn how to do a lot of other naturalist stunts there, too, and Irene Magyar, the Center's manager, prefers just about all of them to bird-skinning, which, as she says, has limited use.

Irene, who is quite a lot more attractive than your average, run-of-the-mill natural history curator, says that her center answers the questions of museum visitors with particular interests. If you want to identify a rock or a plant and have some knowledge of what you are about, the Center can show you similar samples, let you handle them, peer at them through a microscope and dig into a little solid reading about them.

To use the Center, you have to be 12 or over and able to persuade the museum receptionists that you are there for research rather than rubbernecking. And you'd better not show up on Monday or Tuesday, for the Center is closed.

Maybe you've found an Indian arrowhead and want to identify it. The anthropological section has a self-teaching setup which leads you through the various drawers full of similar heads. Maybe you caught a strange insect. Drawers full of them await you. Perhaps you plucked an odd plant. Here you can press it.

So far, many users of the Naturalist Center seem to want advice about fossils. Rock hounds, however, are beautifully catered to with 7,000-odd micromounts (tiny pieces of minerals used with a stereoscope—three-dimensional viewing) and sections of rock cut to slide under a petrographic microscope. This instrument uses polarized light to help identify the mineral consistency of each tiny wafer. You check what you find against written descriptions and so identify—that is, if you can make headway through those descriptions ("Microphenocrysts of augite [some glomeroporphyritic] are set in a matrix of thin laths of labradorite, granular clinopyroxene and dark, essentially opaque glass which is subordinate and interstitial [interstitial texture]. . . ."). Exactly.

The Naturalist Center is one of the educational services of the Institution. Another is one of the newest Smithsonian publications, a sprightly little newspaper named *Art to Zoo* ("A" to "Z," get it?). It is designed for use in elementary schools —third to sixth grades—comes out every other month during the school year, goes to about 8,000 schools and hasn't run into any problems except one. That was in this year's February/March issue wherein there is a photograph of our volcanologist, Dr. Tom Simkin, standing on the lip of Fernandina volcano in the Galápagos Islands. He'd gone there, some years ago, after it erupted and left a caldera.

It's the wrong picture, Ann Bay, who

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With the growth of the Smithsonian Associates, the Institution is striving to meet the needs of its membership by offering a varied travel program. Traditionally, Foreign Study Tours provided culturally oriented, first-class, specialized trips under the guidance of museum curators or experts in respective fields. Then, Domestic Study Tours were added to offer similar opportunities within the United States, thus allowing Associates and their families a chance to combine vacation with a period of study. Two years ago, Foreign Charter Tours were introduced; these trips are larger, lower-cost and more generalized in nature. Associates travel benefits are announced exclusively in SMITHSONIAN. Write addresses below for additional information.

Foreign Study Tours

Baltic, Norway and the Fjords—July 30-August 18: Cruise on the *Argonaut* to Sweden, Estonia, Russia (Leningrad), Finland; spend a week in the fjords of Norway • **The Isles of Britain**—August 19-September 3: Cruise aboard the *Argonaut* from Edinburgh at Festival time to the Orkney, Hebrides and Scilly islands, Northumbria, northern Scotland, Wales • **Peru, Ecuador and Colombia**—September 28-October 19: Art and archaeology. Dr. Elizabeth Benson of Dumbarton Oaks, guest lecturer • Write Miss Bliss Schumann, Foreign Study Tours, SI 123, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5520.

Foreign Charter Tours

English Countryside Excursions*—July 25-August 8: The best of London museums and theater, plus a choice of specially designed four-day excursions to East Anglia and Cambridge, great houses and gardens, archaeological sites, cathedrals, literary England or Pilgrims' Way • **Russia***—October 3-17: The Bolshoi, Moscow Circus, Hermitage; schools, factories and housing in Moscow, Leningrad and Tallinn • **Sultans' Treasures***—October 10-24: An adventure tour to Istanbul and Asiatic Turkey featuring the royal treasury and collections at Topkapi Palace, the Blue Mosque, an evening in a Turkish home and a cruise on the Bosporus. Select an excursion to Aegean Turkey, including Troy and Pergamum, an important Greek and Roman city near Ephesus; or central Anatolia and Cappadocia with its exciting rugged landscape, old caravansary and the unbelievable valley of underground houses and churches that was the center of the Byzantine anchorite movement • **Mexico City and Yucatan**—November 19-30: A study program in Mexico City concentrating on Aztec and Toltec cultures; visits to the Mayan ruins of Chichén-Itzá, Uxmal and Palenque (originates in Mexico City) • Low cost of tours includes first-class hotels, most meals, sightseeing, lectures, theater tickets and air fare. Foreign tours are heavily subscribed, so for additional details concerning a specific trip write early to Smithsonian Associates Travel Program, A&I 1270B, Smithsonian Institution, Washington, D. C. 20560, or call (202) 381-5635 for information. *Optional predeparture course will be available.

Domestic Study Tours

Wind River Mountain—July 30-August 7: A horseback trip into the land of the mountain men; camping at an altitude of 10,000 feet in the midst of turquoise lakes and high-meadow wild flowers • **Desolation and Gray Canyons**—September 30-October 10: A white-water river trip for the outdoor adventurers; explore the geology, wildlife, and Indian and outlaw history of Utah's Green River • **Connecticut Antiques**—August 21-28: Three hundred years of American culture will be represented in this tour of central and western Connecticut. Concentrating primarily on architecture, decorative arts and furniture, the tour will visit museums, special collections, historic houses, private homes and notable antique dealers • **Mesa Verde and Chaco Canyon**—September 24-October 2: Enjoy autumn colors in the Southwest while learning about the history of the Pueblo Indians through in-depth visits to these important archaeological sites as well as the beautiful Canyon de Chelly, Arizona • **Oregon: End of the Trail**—September 10-20: Explore the natural beauty of the Northwest with hikes around Mt. Hood, Crater Lake and Redwood National Park. Enjoy the Ashland Shakespeare Festival and jet-boat ride up the Rogue River • **The River of No Return**—September 10-25: A boat trip on the Salmon River in Idaho past precipitous canyon walls, wide sandy beaches and pine forest in this majestic country rich in wildlife, history and prehistory • **California Wine Country**—October 2-8: From San Francisco, visit selected vineyards, in Napa, Sonoma, Santa Clara and Monterey with wine tasting and special lectures by vineyard owners and wine masters • **Archaeological Dig**—October 15-22: Join archaeologists in the excavation of an Illinois River Valley site spanning almost 10,000 years. Actual digging will be supplemented by instruction, lectures, laboratory work and field trips • **Antebellum Homes of Alabama**—October 29-November 6: In 1850 Alabama's plantation owners were the leading cotton producers of the country. They lived in a grand manner that has become legendary. Under auspices of local historical societies, we will learn about the history and traditions of this "golden era" • **National Air and Space Museum Weekend for the Blind**—October 28-30: Special programs are planned with the museum curators to give meaning to the objects and displays • **Coming in November**—an art weekend in New York featuring the Cooper-Hewitt Museum of Decorative Arts and Design • **Washington "Anytime" Weekend**—Visit the nation's capital and tour the original Smithsonian building. Spend two nights at Loew's L'Enfant Plaza Hotel (reservations required ten days prior to weekend) • Write Associates Travel Program, A&I 1270B, Smithsonian Institution, Washington, D. C. 20560 or call (202) 381-5635 for details.

edits the sheet, admits. The correct one showed Dr. Simkin right down beside the caldera lake in spectacular discomfort, one presumes. But *that* picture blew out of a motorcycle messenger's pouch while on the way to the engraver and is floating around somewhere on the East Coast.

These things happen in journalism. *Art to Zoo* has survived it and is now asking SMITHSONIAN readers to nominate for *A to Z*'s mailing list their favorite schools. I had a friend who once taught for a time in a British public school—not Eton, but a bit like it. He reported that the headmaster, a tall, stern man, used to address each incoming class of new boys with the same speech. He would advance toward them from the podium, grimly menacing in his academic robes, and speak with a slight Oxford hesitation which lent peculiar force to what he had to say:

"I understand, young gentlemen, that, mm, mm, some of you may entertain foolish and, mm, mm, ill-considered notions of *democracy*! Surely you need hardly be told that, mm, mm, while you are in my charge, you will, mm, mm, *forget* them!"

And in contrast, the good ol' American way is to name your favorite school. Do so, dear readers! Send your winners in to Ann Bay (1163 Arts and Industries Building, Smithsonian Institution, Washington, D.C. 20560). Not me. I sort of liked that Englishman.

As you can see by the map in the Highlights column (p. 102), Washington's subway system has at last stretched out and embraced the Smithsonian. You can whiz right up to the Mall station and there you are. If you arrive early you can go to the Court—the Associates restaurant in the Museum of Natural History—for a brunch that just won't quit. You can even order a Bloody Mary or champagne with your eggs and crepes and sausage.

By Metro to a Tiffany breakfast! Champagne! Who needs Paris?

—EDWARDS PARK

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Pruning as a means to more nearly perfect wines.

To us, pruning—the cutting off of living parts of the grapevine—is the single most important practice in the entire culture of grapes.

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That is why, in the Gallo vineyards, we do not consider a man thoroughly experienced until he has been pruning for at least 3 years.

Why We Prune

The whole purpose of pruning is to direct our vines to grow fewer but better grapes—grapes of optimum maturity and with the full potential of their variety.

Such grapes will have acid and sugar contents in perfect balance, and their wine will be full-bodied, deep and brilliant in color, and with a bouquet that is true to the grape.

If we allow a vine to produce too many grapes—a condition called overcropping—we risk producing a thin, watery wine.

Our Unique Next Step

Sometimes, despite judicious pruning, a vine will overproduce anyway—perhaps because of exceptional vigor, or a particularly fertile soil.

In such a case, we resort to thinning.

Thinning involves the actual removal of whole grape clusters from the vine—the sacrificing of a part of our crop in order to ensure the quality of the remainder.

Sometimes this can mean removing as much as one-half the crop from an overproducing vine. Or all of it, if we wish to give the vine a rest to regain its vigor.

Gallo, we might point out, is one of the very few wineries to practice this costly technique of thinning in order to produce only the best possible wine.

How We Prune

Pruning is basically an art. And over the years we have developed techniques that we believe provide the best possible results of that art.

We began researching and establishing our pruning practices back in the 1940's.

At that time, every single variety of grape was given its own program to determine the best method of pruning for that particular vine.

As a result of our tests, we have established some general rules.

One, is that on each spur—that part of the new wood which remains after pruning—we never leave more than two buds for future growth. This ensures optimum grape quality.

We do, however, vary the number of spurs on each vine. This depends on the variety.

For example, the Chenin Blanc and Ruby Cabernet vines are allowed up to 12 spurs, our French Colombard 14, and our Barbera 10.

In general, the vines bearing larger grapes and grape clusters are left with fewer spurs so as not to tax them beyond their capacities, and the vines bearing smaller grapes and grape clusters are left with more.

Who Prunes

Because so much depends on the judgment of our pruners—in addition to how much to cut, at what angle, and which wood—we treat their training very seriously.

At first, a beginner is only allowed to watch. Then he is permitted to work only when an experienced man is watching him. And finally, before working independently, he must work under a foreman.

That is why, as mentioned earlier, it is usually 3 years before we consider him a thoroughly experienced pruner.

Our Goal

Obviously, the reason we are so particular about pruning is the direct relationship it has on the quality of our wines.

Our personal philosophy is that excellent wines can only be made from excellent grapes, and that perfect wines require perfect grapes.

Therefore, because our only goal is to make the finest wines possible—to give you pleasure by bringing you only the fullest perfection of flavor, taste and bouquet—we are totally committed to growing and using only the best quality grapes.

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Book reviews

Acts of God, Acts of Man
Wesley Marx
(Coward, McCann & Geoghegan, $8.95)

"From Ocean City to Orange County," writes Wesley Marx, "we have been attempting to control the wrong agent of disaster. Nature creates hazards; man, particularly urban man, creates disasters. Urbanization, rather than hurricanes and fault zones, needs to be controlled."

This passage conveys the message which *Acts of God, Acts of Man,* seeks to popularize. For Wesley Marx's aim, as in his earlier book, *The Frail Ocean,* is to make more widely known the scientific and technical knowledge of major environmental problems. Here his subject concerns land use, particularly the decision to develop areas subject to recurring natural hazards.

A discussion of the functions of natural hazards presents the first element of Mr. Marx's argument. Floods, hurricanes, earthquakes and the towering waves they launch, tsunamis, are forces "as natural as raindrops or sunsets. They are, if anything, creatures of habit. They cannot exist apart from the same natural processes that generate rain and uplift mountain ranges. What distinguishes them is their high energy."

Floodwaters, whether along the Mississippi or the Nile, bear vitally needed nutrients to the lowlands where Man grows his crops. Winter storms along the coast replenish eroding dunes with loads of sand. Earthquakes relieve the pressures that are built up as plates in the Earth's crust grind into one another.

These natural events, recurrent as the weather, although at greater intervals, constitute threats only when human activity intersects their paths. In this light, we see "disaster as a social rather than a strictly natural phenomenon," a lesson long taught by many planners and scientists, and as long ignored.

Most of *Acts of God, Acts of Man* consists of examples drawn from around the United States of disasters waiting to happen. An extreme case occurs in Huntington Beach, California, a likely candidate for earthquakes and flooding, a city "hostage to natural forces just as impertinent and inevitable as the tides that smash the children's castles" erected daily on the city's beaches.

The most important cases, however, are less dramatic. They illustrate the daily costs and consequences of building in dangerous areas in defiance of nature. Residents of the District of Columbia will be struck by Mr. Marx's discussion of Rock Creek Park, which meanders through Washington unmenacing, for the most part, and, in contrast, of Four Mile Run in the Virginia suburbs. There, uncontrolled urban development in the watershed, or drainage area, has so increased the volume of water running off paved surfaces that flooding is frequent.

Rather than prompting efforts to control development, losses are covered by federal disaster insurance and costly flood "control" measures are erected. Their effects—changing siltation that raises the riverbed, decreasing natural restoration of the shore, increasing the river's speed, and creating a false sense of security among nearby residents and developers—only postpone the danger.

Relying on such cases, Mr. Marx points out public policies that contribute to these disasters waiting to happen. Resistance to planning and land-use controls, the belief that "it can't happen to me"—these are the strongest factors. But there are others, including the willingness of Congress to clean up disasters and to pay for dams and artificial beaches and dunes, but not to require communities to police their development. By citing cities that have rebuilt so as to minimize future disasters—Hilo, in Hawaii, and Valdez, in Alaska—and discussing the potential of the new flood-insurance programs and seismic construction codes now taking effect, the book indicates what policy responses could encourage us to be better attuned to nature in the future.

Finally, *Acts of God, Acts of Man* is

particularly useful in pointing out what we gain from designing *with* nature: "When we urbanize floodplains, we sacrifice other critical land uses such as outdoor recreation and agriculture. By keeping floodplains as open space, we not only reduce hazard risk but *gain* these critical uses." We exchange potential misery and suffering for valuable amenities generally lacking in urban America. Best of all, the book indicates how relatively moderate the costs are for achieving these gains.
—*John S. Rosenberg*
The Conservation Foundation

Simons' List Book
By Howard Simons
(Simon and Schuster, $12.95,
paperback $5.95)

Not on three-, five- or ten-speed bikes (there were no such things) but on single-speed, walk-it-up-if-you-can't-pedal-it-up bicycles, my friends and I would pump our iron to Volunteer Park, the high point of Capitol Hill in Seattle. It had, on clear days, a lovely view to the west of flower beds and the reservoir, downtown, Elliott Bay and, in the distance, the mauve-blue-white profile of the Olympics.

Tourists came there from everywhere to gaze at the view. We came to see the tourists, or rather their license plates. We noted the numbers and colors, and on any Saturday or Sunday noon might jot on our pads the IDs of cars from 40 to 42 of the then 48 states. I don't remember any foreign plates, but it was a good day when you got faraway Maine, New York and Florida.

Besides keeping us off the streets, the expeditions gave us splendid calf and thigh muscles to last the rest of our lives, and gave us—me at least—a lifetime compulsion to make lists. I still cannot go to the supermarket, or set out on Saturday errands, without a list, and it is always a pleasure to meet another list-maker. Like Howard Simons, managing editor of the *Washington Post*—who has done what any of us dedicated list-makers might have done and compiled *Simons' List Book*, in the nick of time for the family tourist season.

Simons' station-wagon-load pacifier had its origin, he says, "in a 9,500-mile seven-week trip across America during the summer of 1975—from the nation's capital to Seattle, Washington, and home again." He probably wishes it had had its origin earlier, so he could have taken it along as a diversion on those long hauls across the Midwest and endless Montana.

By hindsight, he has listed everything you can think of, almost, with space to check it off, note the date and so on—much more than the Simons family or any family could touch base with in a lifetime of trips, but so much the better. Here is a sample list from his lists:

- The states and their capitals, their capitols, their governors' mansions, their nicknames, official birds, trees, flowers. (Five states, unimaginatively, have the mockingbird, though Simons lists 645 north-of-Mexico breeding species they could have chosen from.)
- Islands, and the square mileage thereof.
- Major rivers, notable rivers, wild and scenic rivers, National Park rivers.
- Bridges—major, longest, other; and tunnels—underwater and land.
- High and famous waterfalls (but aha! he's left out Bridal Veil, dropping into the Oregon side of the Columbia. Steaming past one day in 1889, Rudyard Kipling asked the name of a mighty falls and was told, that's Bridal Veil. He snorted that America had all too many Bridal Veil falls, and never did learn that the one he admired was the nearby and mightier Indian-named Multnomah Falls).
- National Parks and monuments, and 27 pages of state and city parks and recreation areas.
- Famous forts and battlefields.
- Trees, a selection of the 1,180 species growing naturally in the United States. Oops, no eucalyptus, growing fragrantly if unnaturally (an import from Australia) in California.
- Mammals, not including Bigfoot, or Sasquatch; fresh- and saltwater fish; edible bivalves; but to be captious, aren't abalones univalves?
- National wildlife refuges, grasslands, lakeshores, seashores, preserves.
- Zoos and aquariums.
- Trout streams, a fisherman's choice of.
- Wild flowers, popular garden flowers, houseplants, flower festivals, gardens.
- Dogs and horses; no cats.
- Famous trails, but not including Oregon's Barlow Road.
- Presidential birthplaces and graves.
- "Literary Heritage" meaning authors, their hometowns and houses.
- Our architectural heritage, from Tombstone, Arizona, scene of the notorious 1881 gunfight at the OK Corral, to New

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• A couple of pages of "George Washington slept, spoke, ate, drank, prayed here."

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I could go on—and Mr. Simons does, for 414 pages ending with "games I have played"—but I'm tired, he must be too (for all he's a tireless list-maker), and so must be the children, falling-asleep tired after a day on the Interstates and the byways. Don't take the kids on a long trip without him.

—Richard L. Williams

Discover Toronto
John Richmond
(Doubleday, $12.50)

Toronto revels in the distinction of being the city with the tallest tower and the widest expressway in the world. John Richmond enjoys his own distinction as the first Canadian artist to cross the U.S. border and have a customs officer refuse to charge duty on his artwork ("because it's junk"). In *Discover Toronto,* an illustrated notebook, Mr. Richmond draws and writes a decidedly unjunky 120 pages of nostalgia for the city as it was before it succumbed to the high-rise builders and the shopping mall promoters.

Succumb it has, yet much of the starchy Victorian past remains stubbornly intact and alive, and that, perhaps, is what makes Toronto a rare success among North American urban centers.

In 1862, Anthony Trollope wrote that "Toronto as a city is not generally attractive," and many a visitor in the next 100 years or so (including Charles Dickens) shared his distaste. Smug and complacent, Torontonians ignored the insults and went their dour and sedate way, and awoke only recently to realize that Toronto the staid had somehow become Toronto the swinger.

While other cities may worry about violence or near-bankruptcy or the energy crisis, Toronto boasts of its safe streets, piles up more skyscrapers and leaves the lights blazing all night. Torontonians are as smug and self-centered as ever they were—even today, the opening of a new department store stirs more public sentiment than the threat of Canada fracturing over the Quebec problem—but the city is a vibrant hive of affluence, business, drama, art, fashion and good food.

Mr. Richmond ignores all that. Not for him are the opulent underground plazas, the boutiques or the 72-floor marble banking temple that washes itself automatically every 60 hours.

Instead, he deals fondly with the old facades of buildings preserved in grime, and the aging village neighborhoods whose survival is one of the reasons why the city center continues to function as well as it does. They make residential islands in the downtown core and they mingle the WASP inhabitants with the immigrants from Europe and Asia.

The book's 73 drawings—bold, charming and free-flowing—illuminate the faded grandeur, the tacky remnants, street markets, old factories. Only three drawings show modern aspects, one being the "new" city hall that has been standing for 19 years but whose futuristic chassis still offends some of the older generation.

Toronto's "new" city hall

The text, written in the author's handlettering, is as intimate and personal as the illustrations, graceful with swirls of wit and eccentricity. "Whatever historic stuff you read here is mostly true," he assures us, but his selection of information is quaint and squiggly, and not much use as a guide to contemporary Toronto.

The city began as a fur-trading post, became the capital of Upper Canada in 1793, and was captured in 1813 by American troops. Its 625 citizens were under occupation "for eleven inglorious days," as one of them wrote, and the town was "thronged with Yankees." The Americans are still here—expatriates who have chosen to settle in Toronto, and tourists admiring what has been acclaimed as "a model of the alternative future: a city that works."

—David Lancashire
The Globe and Mail, Toronto

Gunpowder Treason and Plot
C. Northcote Parkinson
(St. Martin's Press, $8.95)

"Remember, remember the fifth of November, Gunpowder treason and plot." In England the day has been remembered and commemorated ever since 1605, when the hapless Guy Fawkes was discovered in the vaults beneath the House of Lords preparing to blow up King and Parliament with 36 barrels of gunpowder.

Guy Fawkes Day remains as a unique annual event in Britain's history. For most British children it is still one of their earliest and most exciting memories. Rockets and "bangers" and catherine wheels and guys stuffed with straw blazing on bonfires have lit up the night in cold, damp November gardens throughout the country for nearly four centuries.

It is also a dramatic reminder of a fiercer age of religious fanaticism and intolerance when bonfires were used to burn not effigies but real people, and of the grisly events that followed the Gunpowder Plot.

The plot itself was hatched by a group of disgruntled but incompetent English Catholics who worked out a harebrained scheme to assassinate the new Protestant King James I and replace him with a Catholic monarch. Most of them were well-known troublemakers, and Guy Fawkes was recruited because he had been away for years fighting with the Spanish army in the Netherlands and was unlikely to be recognized by the police. He was also familiar with siege warfare and therefore probably a mining expert.

The author of *Gunpowder Treason and Plot* attended the same school as Guy Fawkes, St. Peter's in York, although several centuries later. He is also that English humorist, historian and scholar who invented the famed Parkinson's Laws, among them that "work expands so as to fill the time available for its completion" and "expenditure rises to meet income."

In the days of Elizabethan England and the early Stuart monarchs, there was a treasonable plot every few years, usually involving France or Spain, in an attempt to restore the old religion which had been outlawed under Henry VIII. These followed a familiar pattern of betrayals, arrests, tortures, penitent speeches before the scaffold, brutal executions and a general roundup of political opponents, guilty or innocent.

For Robert Cecil, Earl of Salisbury, who ran the secret service of those days, the Gunpowder Plot was heaven-sent. "The crime proposed was so terrible that its discovery would paralyse the Catholics for at least a generation," says Parkinson. "It would brand them as regicides, anarchists and murderers."

It also provided Salisbury with a chance of implicating his powerful enemy, the Earl of Northumberland, who was related to one of the plotters, and of discrediting the Jesuits who were working underground in England to keep the Catholic religion alive.

At first the plotters rented a building adjacent to Parliament House and started making a tunnel to enable them to position the gunpowder beneath the House of Lords. But it became waterlogged. They went elsewhere.

November 5 was to be the day of the opening of Parliament to debate the proposed union between England and Scotland. But in the early hours of that morning the cellars were searched and Guy Fawkes was found with the gunpowder, slow matches, touchwood and a lantern—now at the Bodleian Library in Oxford.

After five days on the rack, he named his accomplices. These conspirators, who had also planned an uprising in the Midlands to coincide with the holocaust, were either killed or captured.

Most of the plotters were hanged, drawn and quartered, the Earl of Northumberland was sent to the Tower for life, and Father Henry Garnet, the leader of the Jesuits in England, was hanged for treason. The Earl of Salisbury became a Knight of the Garter, the highest honor Britain can bestow. But Guy Fawkes won the lasting fame. His name, which came to mean an effigy, crossed the Atlantic where it came to pass that all men are guys, both good and bad.

—Richard Beeston
Washington correspondent for
the London *Daily Telegraph*

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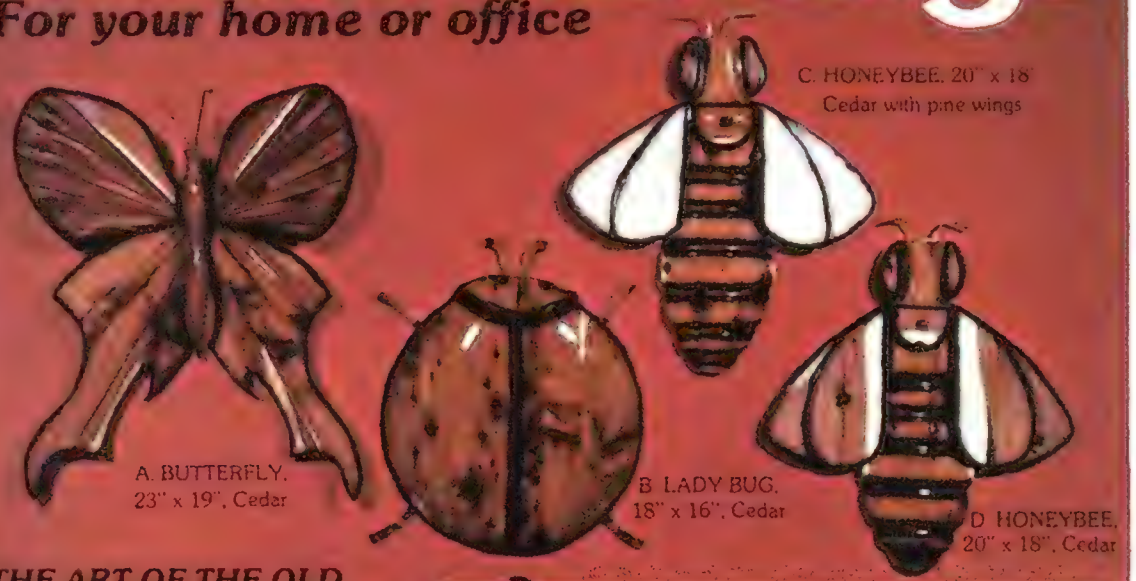

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The National Portrait Gallery has established a permanent Department of Photographs and gathered together a selection of best prints for a first showing. The Museum of History and Technology is featuring "Photographing the Frontier" through October 23. The Museum of Natural History will open "Photographs: California River Areas," on July 23.

Museum of History and Technology
A "Fourth of July Celebration" will bring back turn-of-the-century picnicking for three days on terraces in front of the Museum of History and Technology, with entertainment in many areas around the museum. Amusements will include music, social dancing, crafts, sidewalk chalk artists, softball and horseshoes. For details on the celebration planned for July 2, 3 and 4, call (202) 381-6264.

The "Folklife Festival," usually held in July, is being scheduled this year for six days in October.

"Silver Jubilee," an exhibit commemorating the 25th anniversary of the reign of Britain's Queen Elizabeth II, will continue through Labor Day with letters, documents, paintings and porcelains.

Anacostia Neighborhood Museum
It is to be a children's summer at Anacostia, featuring a "Young People's Film Festival," an education center geared to 300 years of community history, and demonstrations of quilt making, spinning, toy making and taffy pulling. For further information, call (202) 381-6731.

Renwick Gallery
"Wrought Iron: Renderings from the Index of American Design" opens July 2.

Metro's Smithsonian Mall station
A new line on the Washington subway system from RFK Stadium to National Airport will open July 1, completing 15.4 miles of passenger transportation to the Mall. The Metro will operate weekdays only, 6 A.M. until 8 P.M.—on July 4 noon–midnight (see Around the Mall, p. 95).

Metro subway line from RFK to airport, opening July 1, to include Mall stop.

Freer Gallery of Art
A special memorial show for the late director of the Freer, Dr. Harold P. Stern, who died on April 3, 1977, will continue through the summer. It will include the finest Japanese paintings, sculpture and ceramics added to the collection under Dr. Stern's directorship.

National Zoo
The polar bears come out from behind bars in early July to enjoy a new moated home. Zoo visitors will be able to view the bears above ground and through a window into their swimming hole.

National Portrait Gallery
"Illustrators of the Civil War" by Conrad Wise Chapman and Winslow Homer will be on view until September 5. The 30 illustrations document Civil War battle areas, campsites and forts (see cover and Mathew Brady photographs of Civil War, p. 24).

Hirshhorn Museum and Sculpture Garden
"Summer Sculpture 77: Jules Olitski" is the first touring exhibit to be opened outdoors on the museum's plaza level. The six large-scale steel sculptures will be exhibited July 20 through October 2.

National Collection of Fine Arts
"Painting and Sculpture in California: The Modern Era" is a comprehensive survey including 270 works—continuing through Labor Day.

Smithsonian Institution Traveling Exhibition Service
For 25 years SITES has been sending outstanding museum exhibits throughout North America. To find out how to bring a show to your area, write: Smithsonian Institution Traveling Exhibition Service, Washington, D.C. 20560.

- Colorado Springs, Colorado—"Divine Favors, Human Vows: Ex-votos from Puerto Rico" brings examples of folk art, meant as offerings for saints. Colorado Springs Arts Center, July 2-August 7.
- San Francisco, California—"A Cartoon History of United States Foreign Policy, 1776-1976" uses 127 cartoons to trace the development of America's foreign policy. Citizens Savings and Loan Association, July 23-August 5.
- Jacksonville, Florida—"Space Art from the USSR" includes oils, etchings and

sculpture depicting space exploration. Florida Junior College Continuing Education Center, July 30-August 28.

• Minneapolis, Minnesota—"Treasures of Cyprus" presents nearly 8,000 years of Cypriot art through a selection of pottery, sculpture and jewelry. Minneapolis Institute of Arts, July 2-August 4.

• Edmonton, Alberta, Canada—"Belgian Gunmaking and American History" provides a look at 150 firearms tracing the history of Liège arms in the United States, July 30-September 11.

When Associates visit Washington

Upon arrival at the Smithsonian, members are invited to register at the Associates Reception Desk in the Smithsonian castle on the Mall. Here, from 10 A.M. to 4 P.M. daily, special orientation materials may be obtained.

Associates planning a trip to the Smithsonian may send a postcard or call for an information packet: Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560; call (202) 381-6264.

If you have misplaced your membership card, the Associate receptionist in the castle will issue a replacement upon presentation of your Smithsonian magazine address label.

Special summer membership benefit

Associates now may enjoy daily breakfast service, as well as luncheon and dinner, in the members dining room "The Court," in the Museum of Natural History.

Breakfast features include a range of traditional fare, plus such special taste treats as cheese-filled crepes with strawberry topping. For adults: $2.95, children: $1.95. No reservations.

Early morning admittance by Associate card via Constitution Avenue entrance only—breakfast, 8:30 to 10 A.M.; luncheon, 11 A.M. to 3:00 P.M.

Summer Museum Hours

Most museums on the Mall—Arts and Industries, Hirshhorn, Air and Space, Natural History, History and Technology, and the Smithsonian castle—are open daily 10 A.M. to 9 P.M. The Freer, National Collection of Fine Arts, National Portrait Gallery and Renwick close at 5:30 P.M. The Zoo buildings are open daily 9 A.M. to 6:30 P.M., Zoo grounds from 6 A.M. to 8 P.M. and the Anacostia Neighborhood Museum 10 A.M. to 6 P.M. weekdays and 1 P.M. to 6 P.M. weekends.

AFTER WE USE a barrel for aging Jack Daniel's, our employees can use it for just about anything.

Mr. Yodeler Brannon here might chop his in half to use as a planter. Or set it outside to catch rain in. If he's handy, he could turn it into a barbecue grill. Or even a living room chair. They have hundreds of uses, these old barrels. But after a sip of Jack Daniel's, we believe, you'll know the most important use of all.

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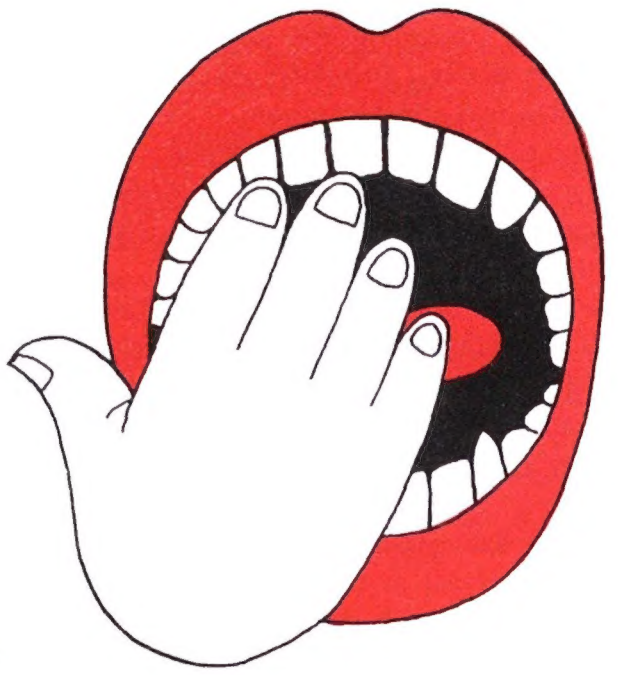
By Patrick Ryan

There's no such thing as a little *boredom*



I can't define precisely why, but it seems somehow appropriate that a British institution should be among the first to proffer payment to people for being bored. Scientists of the Ministry of Defence have been conducting tests on the boredom levels of servicemen who are required by the techniques of modern warfare to spend long periods staring at blank radar screens, while still remaining alert enough to spot the vital, visual intrusion when it occurs.

"We want to isolate the causes of boredom," explained the controlling neurologist, "to find out what happens in the brain and how it can be counteracted."

So volunteer guinea pigs were paid $7 a day, plus lunch allowance, to sit in darkened rooms before television screens displaying a tranquil country landscape. As infrequent vehicles passed across the scene, each subject had to identify them by pressing a buzzer: once for a lorry, twice for a van and thrice for a car. Meanwhile, electrodes stuck about his person recorded his mental, muscular and metabolic reactions on some hundred yards of computer paper, to check whether he was vigilant enough to ensure that we all receive that apparently vital few-minutes' warning of nuclear onslaught. I've never been quite sure what you and I are expected to do during the next few minutes, apart perhaps from somewhat overboiling an egg, apologizing to the wife for everything or, maybe more sensibly, repeating the Lord's Prayer eight times.

Byron decided, some 150 years ago, that society was already then "one polish'd horde, Form'd of two mighty tribes, the Bores and Bored." Having taken their studies thus far into the passive plight of the latter tribe, the Ministry researchers might well extend their studies to cover the depredations of the former faction.

Another hundred yards of computer paper might gainfully be devoted to charting the stupefying effect on the guinea pigs of being dished out the verbal dullsville by a series of highly acknowledged bores, selected by the votes of their daily sufferers in offices, bars and similar gathering places where the deadly droners lurk in wait for their prey. Not only might the anesthetic potency of different breeds of bores be recorded, and an order of avoidance established, but the inner urges which compel bores to be bores might be isolated for possible dietary, psychological or surgical treatment.

The only precise statistic about the ennui peddlers to come my way was provided in John Updike's finding that "A healthy male adult bore consumes each year one-and-a-half times his own weight in other people's patience."

I don't know what scale Updike used in arriving at this calculation. There is, however, some useful literary advice available for all who may be anxious not to glaze the eyes of their conversational companions. Bert Leston Taylor, who founded the Chicago Tribune's *Line o' Type or Two* column, warned that a bore is a man who, when you ask him how he is, tells you. Voltaire, who, judging by his own encyclopedic and dogmatic output must have known a bit about the buttonholing business, contended that the way to be a bore is to say everything. Ambrose Bierce struck home when he classed a bore as a person who talks when you wish him to listen—thus bringing chill reminder of cocktail soirées when you, bons mots polished to flash point, fidget and wait only for the floor-holder to pause for breath so you may leap in and scintillate.

It is passing strange how rarely bores, like whales, have to come up for air. And the 19th-century Italian poet Giacomo Leopardi makes uncomfortable those memories of gregarious occasions when, in your own ears at least, you undoubtedly scored a silver-tongued triumph. He pronounced that if the best company is that which we leave feeling most satisfied with ourselves, it follows that it is the company we leave most bored. After due reflection, I doubt that I shall ever unseal my lips in anyone's salon again. Well, after still further reflection. . . .

My experience at the receiving end, however, has identified certain brands of Carborundum-tipped bores. High among these terrors is the chap who never arrives anywhere without retailing to the company the record speed at which he made his journey and detailing every roadhog maneuver and ingenious twist of the route by which he achieved it. I hide in kitchens from such people.

Fast footwork is needed to elude the compulsive hobbyhorse rider who neatly turns each talking point back to his own prevailing obsession—which could be, currently, ozone layers, acupuncture, meditation, red menaces or yellow perils—and delivers his remorseless lecture thereon in accusatory monotone.

In such circumstance, Montaigne ruefully reflected that it is better to be alone than among bores, and lest anyone hereabouts may now be nurturing longings for such freedom, it may be wise to take my leave with the anxious hope that I haven't been boring you, have I?

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New KODACOLOR 400 Film

To give you an idea of diamond values, the piece shown is available for about $1600. Your jeweler can show you other diamond jewelry starting at about $200. De Beers Consolidated Mines, Ltd.

She usually laughs at my anniversary gifts,
but this year, I think she's going to cry.

A diamond is forever.